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ABSTRACT

Highlighted are opportunities for greenway development and protection. It encourages careful management in the use of waterfront land, early planning for public access and enjoyment of cleaned rivers, streams, and harbors, and efforts to ensure that these bodies of water are not repolluted by new, indiscriminate development attracted to their shores. All phases of planning and implementation of greenway projects are covered, and many diagrams and examples are used. (EE)

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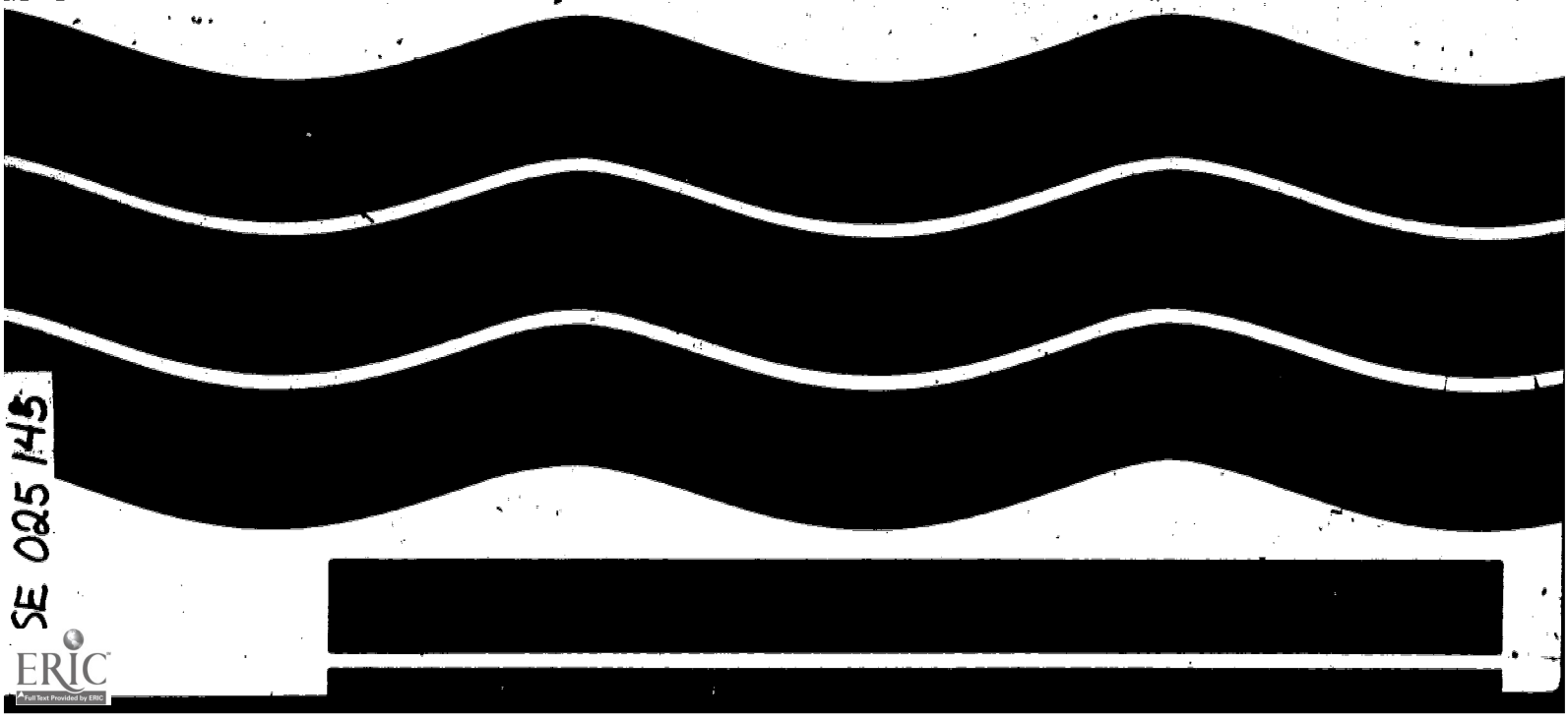
The Public Benefits of Cleaned Water: Emerging Greenway Opportunities



Credits and acknowledgements.

This booklet was written and illustrated for the Environmental Protection Agency's Office of Land Use Coordination by Howard Deardorff, Environmental Design and Research Communication consultant, 367 Tiverton Way, Lexington, Ky.

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The Public Benefits of Cleaned Water:

Emerging Greenway Opportunities

Preface

This booklet was funded by the U.S. Environmental Protection Agency's Office of Land Use Coordination. It represents one of a series of publications and audio-visual materials on securing the public benefits from Federal, State and local water clean-up efforts. As many communities have already discovered, the construction of wastewater treatment facilities, permitting and clean-up of point sources of pollution, and area-wide water quality planning, have resulted in improved waterfronts with new potential for public and private use. This improvement is reflected in increased open space and recreational opportunities.

This publication highlights opportunities for greenway development and protection. It encourages careful management in the use of waterfront land, early planning for public access and enjoyment of cleaned rivers, streams and harbors, and efforts to ensure that these bodies of water are not repolluted by new, indiscriminate development attracted to their shores.

The initiative to secure the Public Benefits of Cleaned Waters represents a combined effort by EPA's Office of Land Use Coordination, Office of Water Planning and Standards, Office of Water Program Operations, and the Bureau of Outdoor Recreation in the Department of Interior. EPA and BOR Regional Offices have also been closely involved in the effort.

Shelley M. Mark
Director
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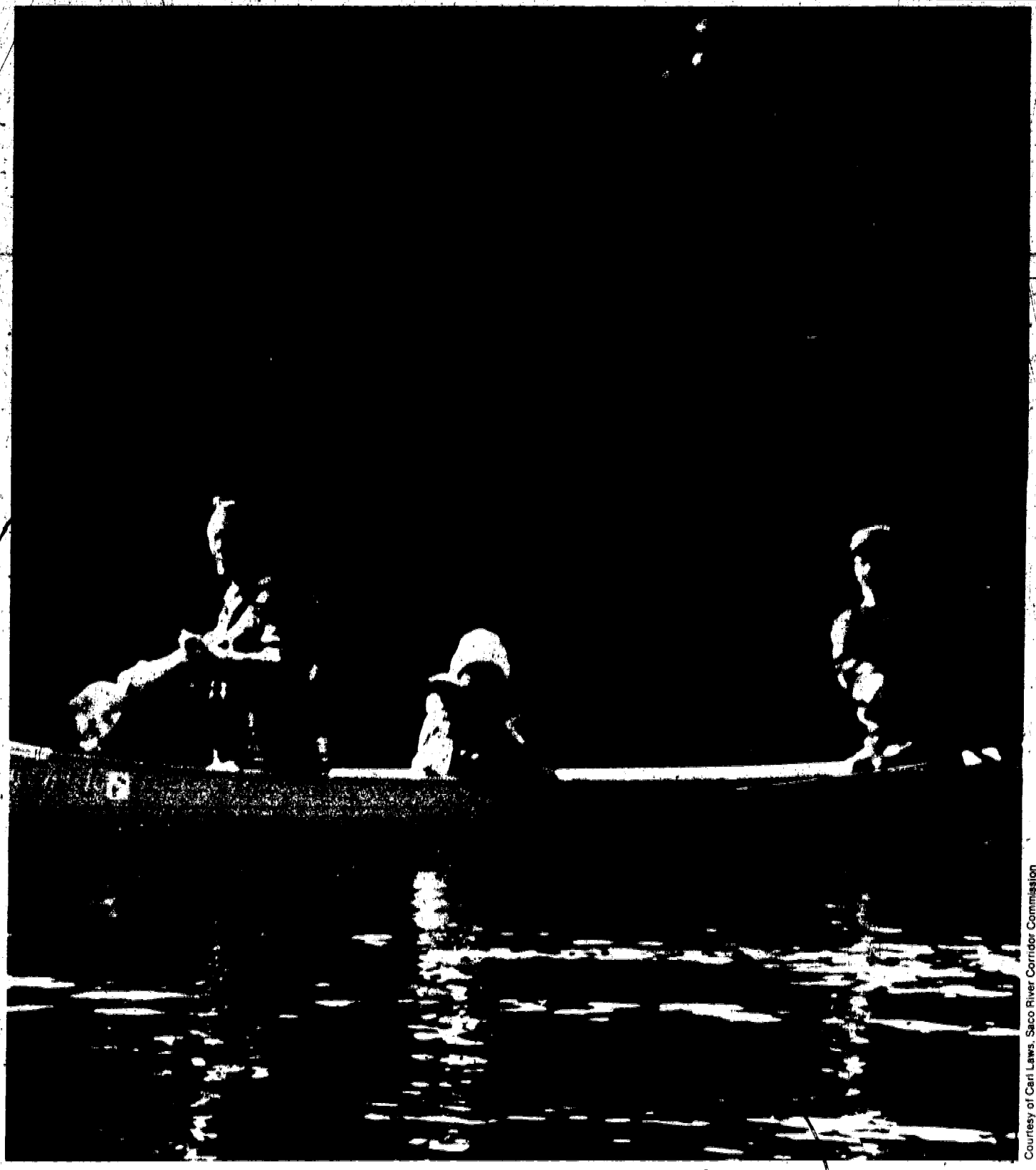
Canoeists Enjoying the Saco River Greenway



Courtesy of Carl Laws, Saco River Corridor Commission

Background and Purpose

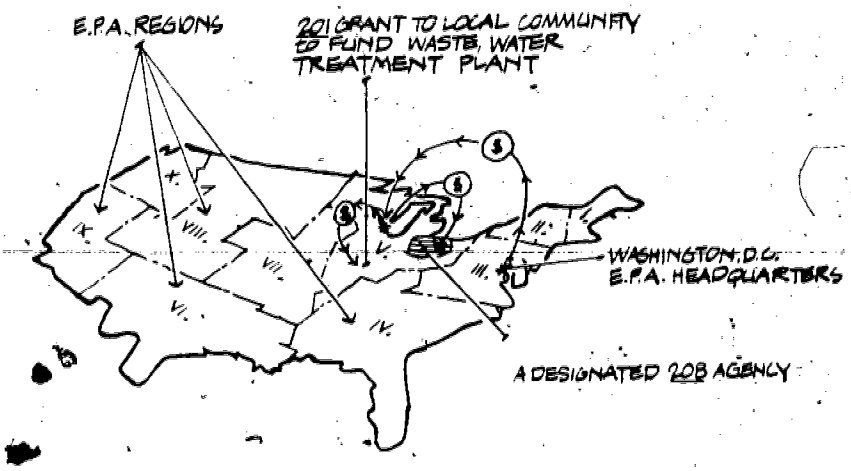
The water clean-up mandate

In 1972 Congress passed the Federal Water Pollution Control Act Amendments, also known as Public Law 92-500. This legislation set a clean water goal of 1983 for a massive effort to make our water resources fishable and swimmable. Three programs, Sections 201, 208, and 402 of P.L.92-500, provide the impetus for reaching the 1983 goal.

The Wastewater Treatment Facilities or 201 program provides funds for the planning, design, and construction of wastewater treatment facilities to purify water before it is discharged into rivers, streams, lakes, and other natural or man-made water bodies. The program represents a Federal commitment of $18 billion. These funds are obligated to local projects which are ranked on State priority lists on the basis of water pollution control need. Funds for the program are administered through the Environmental Protection Agency's Regional Offices, coordinated by State governments and passed through to local communities.

The State and Areawide Water Quality Planning or 208 program provides funds for developing areawide waste treatment planning and management strategies. As with the 201 program, funds are administered by EPA's Regional Offices and coordinated by the State governments. Because much of the planning and management must be regionally oriented, however, a large portion of the funds are allocated to designated regional agencies. These planning agencies are required to develop and submit detailed proposals to both the State Government and the EPA Regional Office for water cleanup. 208 funds are also allocated to the States for water quality planning in the remaining areas of the country not covered by the regional agencies and for coordination of regional plans.

Section 402 of the Act establishes the National Pollutant Discharge Elimination System (NPDES) and requires all water polluters to clean up their discharges on a legally regulated timetable. This permit system will require the best practicable control technology available. Individual States can administer the NPDES if they demonstrate that their management effectiveness meets Federal requirements. The 201, 208, and 402 programs involve local initiative and a willingness to cooperate to ensure the achievement of the 1983 clean water goal. (1)



(1) The 201 and 208 Funding Effort Toward the 1983 Clean Water Goal

The implications of 201, 208, and 402

The impact of the 201, 208, and 402 water cleanup programs is sometimes difficult to envision. In a crisis-oriented world we are not conditioned to expect good news about emerging positive benefits. The purpose of this booklet is to describe the opportunities and benefits resulting from the cleanup of our Nation's waters.

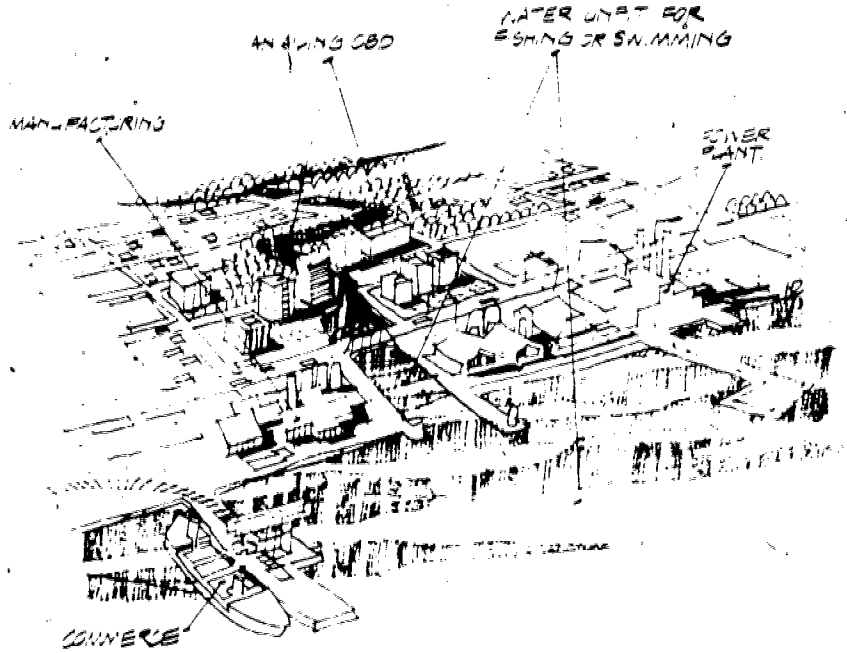
The notion of developing greenways is not a new idea. With the cleanup of our waters, however, new greenway opportunities are appearing with regard to water-oriented land. To fully realize the benefits of these opportunities, the booklet addresses three central questions:

1. *What is a water-oriented greenway?*
2. *Why are water-oriented greenways needed?*
3. *How can they be planned and implemented?*

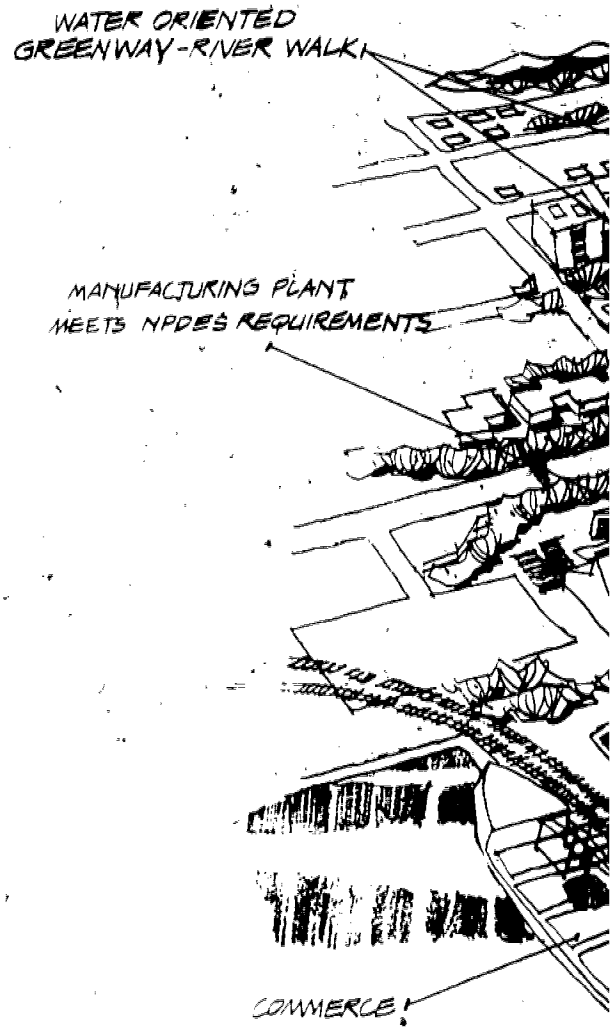
The answers to these questions can provide a framework of understanding which can lead to positive and decisive community action.

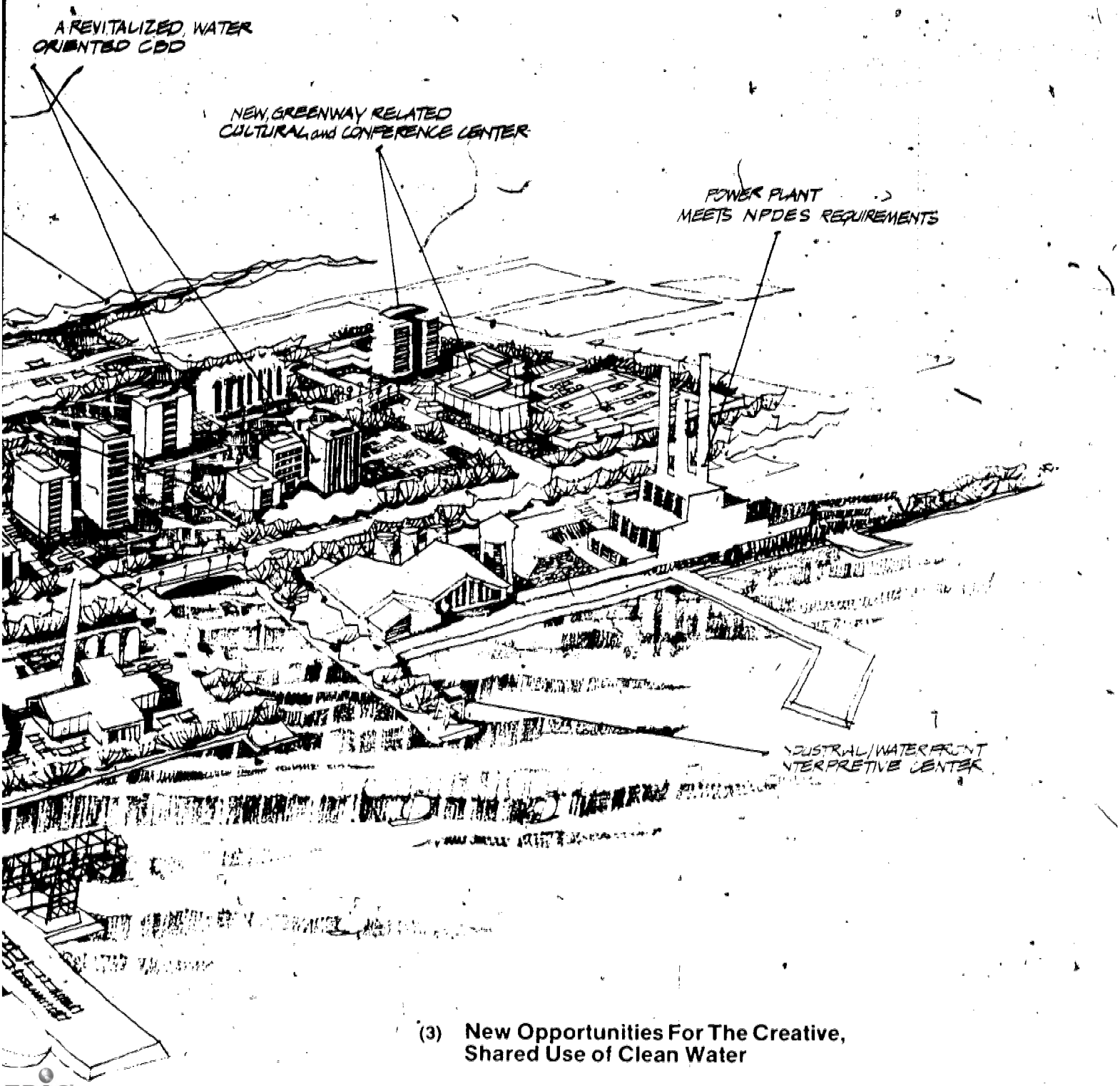
Timing is critical

With the rapidly approaching 1983 clean water goal, the timing of action on water-oriented greenways is critical. The wastewater treatment facilities funded by the 201 program are becoming operational and the National Pollutant Discharge Elimination System (NPDES) is requiring all water polluters to clean up their discharges on a legally enforced timetable. Waterside land values will rise sharply *after* the water is clean. Until that time, water-oriented land will have no real recreation or aesthetic value.(2) *Now* is the time to acquire greenway water frontage, negotiate use easements, and establish land development performance controls to assure your communities' water-oriented greenway potential. Our riverfronts and shorelines evolved over a 250 year period to a complex system of shared water resources. Our water resources have suffered in the past, but local initiative coupled with the 201 and 208 programs has begun to turn the situation around. The opportunities for establishing water-oriented greenways are fast upon us. The public has a right to the benefits of clean water.(3)



(2) The Existing Conditions





(3) New Opportunities For The Creative, Shared Use of Clean Water

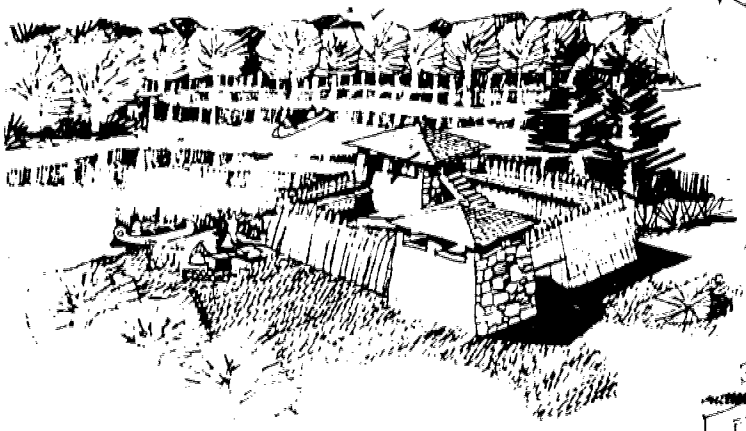
What is a Water Oriented Greenway?

The traditional stereotype definition of a greenway is illustrated in some textbooks on open space planning as a wide, uninterrupted expanse of forest and meadow with the intermittent scattering of passive parks and pedestrian trails. In the context of the existing waterfronts found around the country, however, we find a wide range of landscape and land use characteristics. When attempting to initiate water-oriented greenways in the urban context, a city administrator or environmental conservancy group's first encounter with the land ownership values of the local citizenry presents some formidable obstacles to the development of expansive greenways. It is at this point that many would-be greenway advocates throw up their hands and turn to other more practical and pressing matters. The greenway as defined above, doesn't present a realistic land use alternative for urban shorelines and riverfronts. In a rural or natural context where development pressures and precedents are less prominent, the implementation of a more expansive and protective open space corridor makes more sense.

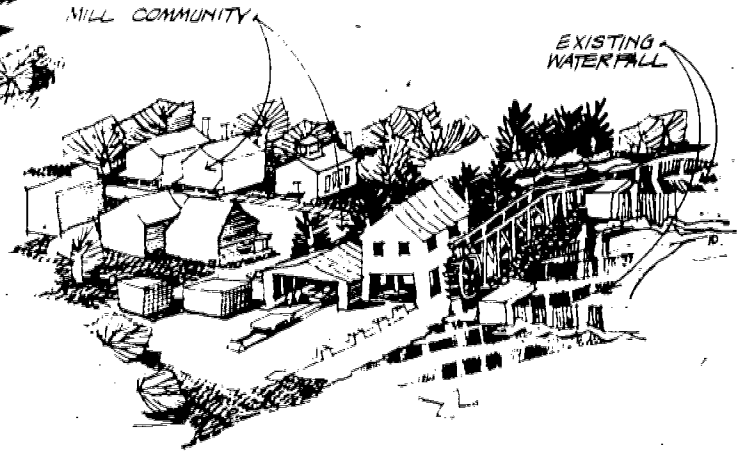
The evolution of waterfront land uses

To derive a more realistic and workable definition of water oriented greenway, we need to understand how our present day waterfront land uses came into being. The waterfront has had many diverse uses in the United States over the past 250 years. Even before the signing of the Declaration of Independence, rivers had provided a framework for military expenditions and early commerce.(4) Later, as settlements became more sophisticated, water-powered mills began to appear on the rivers where topography permitted. Many of these mills exist today as historical monuments.(5)

The invention of the steam engine signalled the beginning of what has come to be known as 'the industrial revolution.' This period brought prosperity in the form of a much higher standard of living and greatly increased opportunities for education, improved transportation, better communications and, unfortunately, a change in attitudes about the natural environment as something to be appreciated. Industrial and manufacturing needs for water shifted from power to the need for water as an agent for cooling and processing.(6)It was this shift that resulted in the release of highly toxic pollutants into our streams and rivers. The quantity of pollutants exceeded the capacity of the water to be naturally cleansed through recycling and water pollution began to occur on a massive scale.



(4) 1. Water as a Transportation Network



(5) 2. Water as a Power Source

The Twentieth Century brought on more and more complex forms of technology such as the petrochemical industry, advanced food processing, fossil fuel and nuclear energy generation facilities, sophisticated storm drainage collection systems, wastewater treatment facilities, heavy shipping, and recreation. The resulting waterfront land uses are not conducive to the utopian greenway defined earlier. The implementation of 208 plans, the construction of wastewater treatment facilities and the permit requirement for industrial development is resulting and will continue to result in a steady and timely improvement in water quality along our now neglected waterfronts. This turning point offers exciting opportunities for water-oriented greenways.

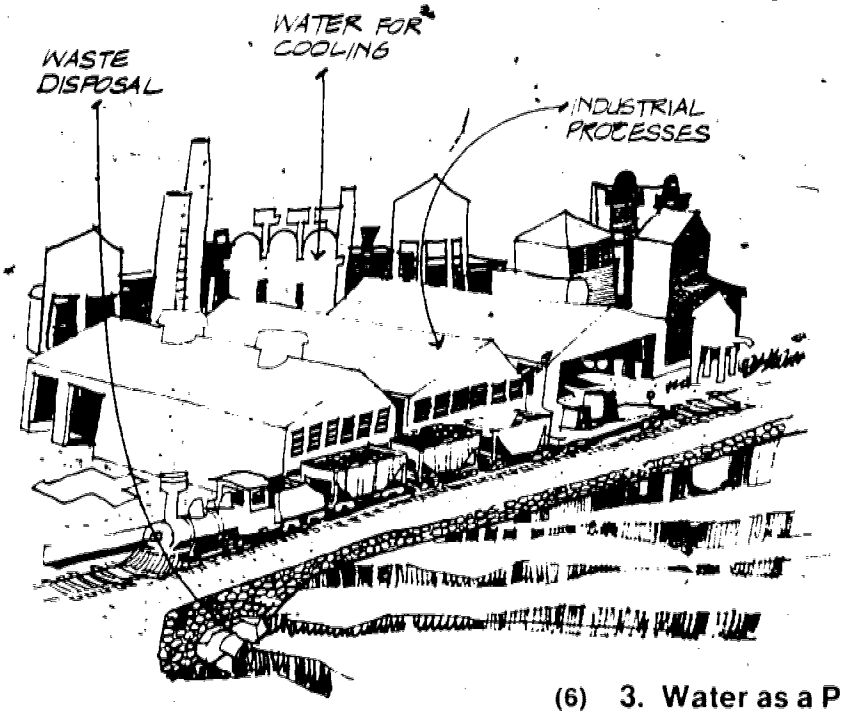
To realize these opportunities, however, greenways must be viewed from the following perspective:

1. One of the most significant values of a greenway is in the area of environmental protection. Greenways provide vegetative buffers which filter out nonpoint source pollutants such as soil sediment and chemical fertilizers before they reach water resources. This is especially valid in areas that are just beginning to face development pressures. Water-oriented greenways can also provide excellent non-structural controls to prevent flood and storm damage.

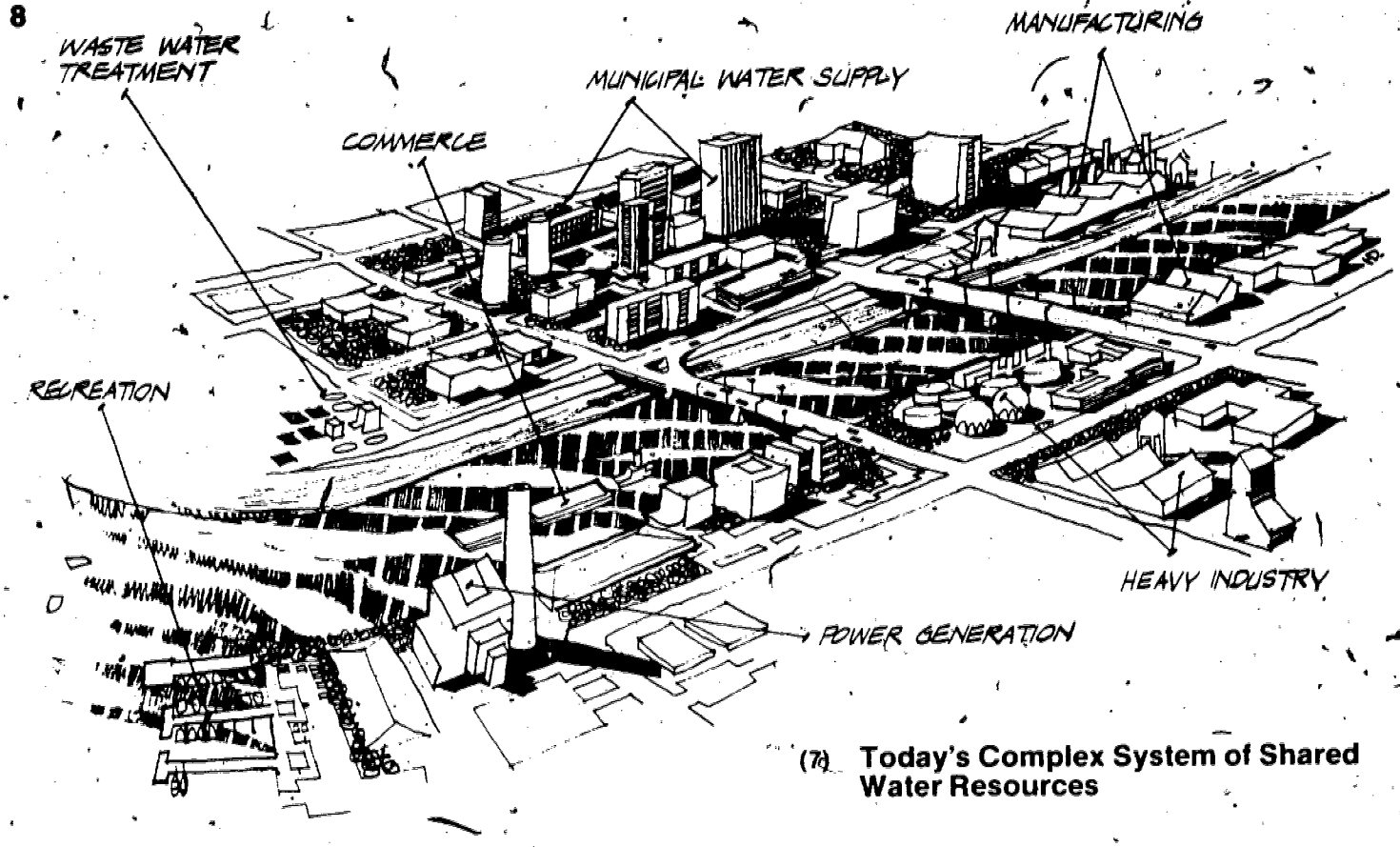
2. Industries and wastewater treatment facilities need not be considered as ugly intrusions on the riverfront or shoreline. They are part of what it takes to sustain our lifestyles and the conveniences of daily living. They should not be hidden, but rather, more carefully sited and designed so as to avoid environmental damages. The public should know they exist and, if practical, how they work and what effect they have on the environment.

3. Water-oriented greenways need not be an arbitrary or capricious dimension in width. They can be as narrow as six feet (the width of a pedestrian-bike way) or they may be miles wide as in the case of extensive wetland areas.

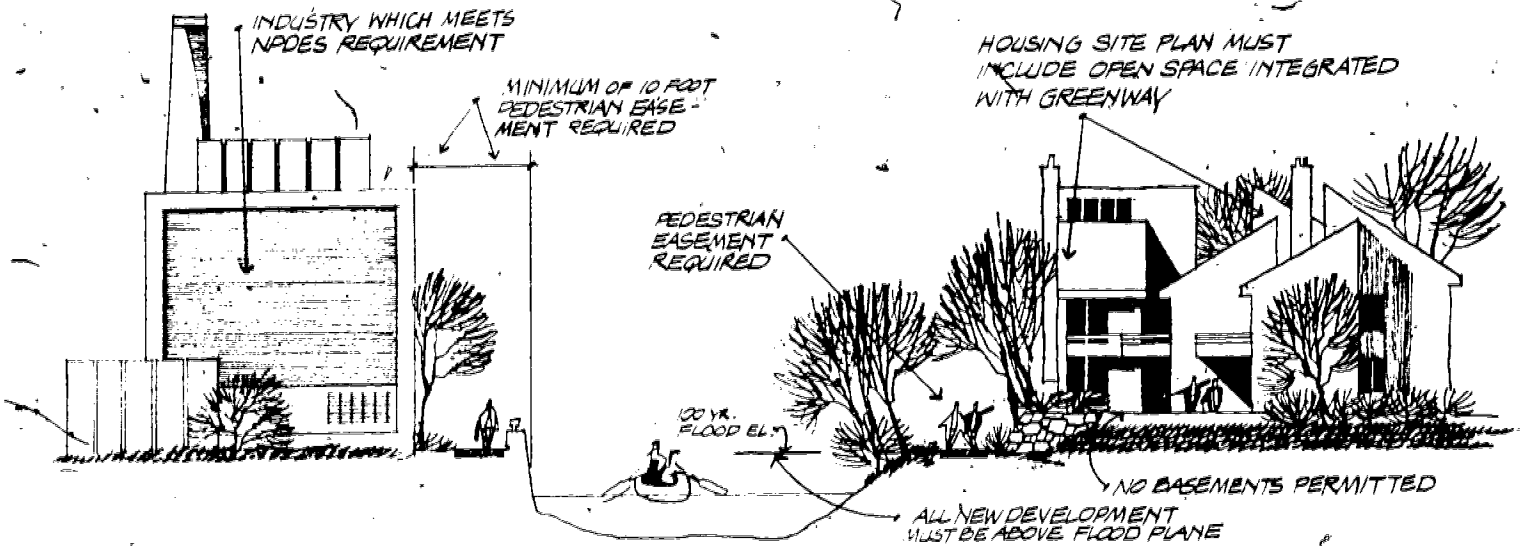
4. The implementation of a water-oriented greenway system is a slow, long-range process and, as a result of this, its achievement involves community commitment to long range goals. The plan must include a balance of specific objectives and the flexibility to adjust to unforeseen opportunities and constraints. A broad range of land use rights must be considered ranging from outright purchase to other less-than-fee simple methods.



(6) 3. Water as a Processing Agent



(7) **Today's Complex System of Shared Water Resources**



(8) **The 'Urban' Water Oriented Greenway Requires a Performance Control Emphasis**

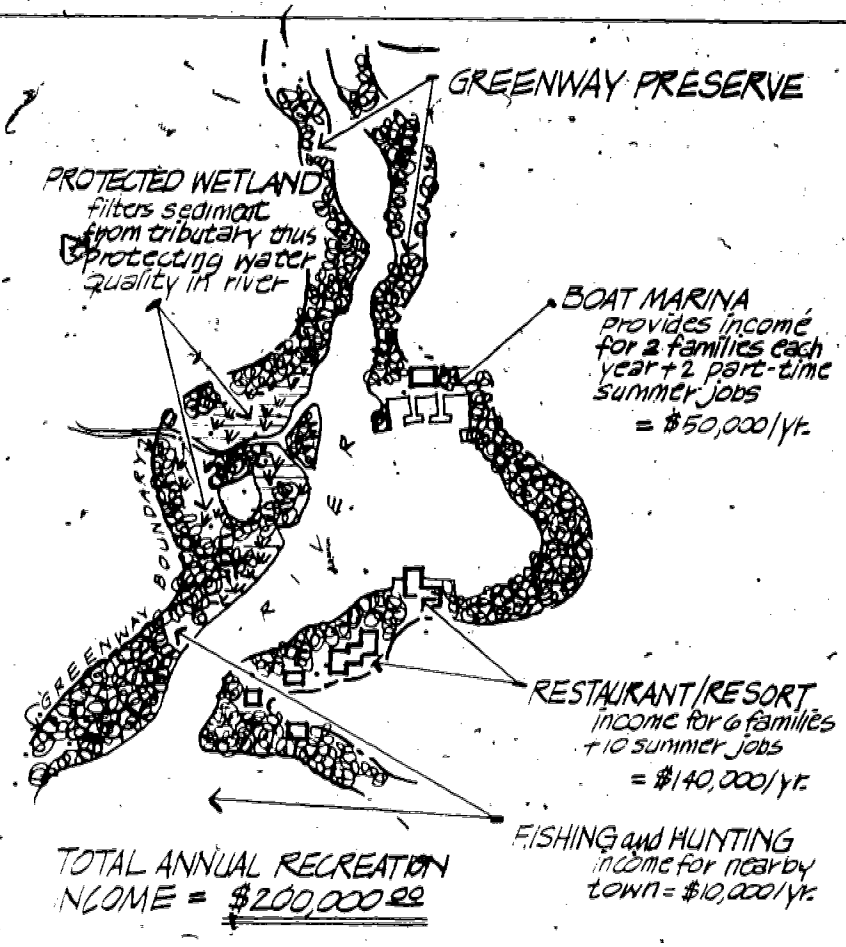
In the past, sweeping and rigid approaches to creating water-oriented greenways have not been successful because they have failed to recognize that water is a shared resource. (7) Industry and commerce need water for survival. While protective stances are appropriate in more natural, undeveloped areas, the idea of arbitrarily replacing industrial uses with open space does not always make sense. In the urban context, the new definition of greenways involves an emphasis on *how* we use our riverfront rather than *what* land uses are acceptable. (8)

With this new perspective, a flexible approach to greenway development can be implemented. This approach must recognize the difference in land use character between urban and natural waterfronts. While an urban waterfront demands a more integrative and adaptive approach to greenway development, more natural waterfronts may require a more protection oriented planning and management greenway development strategy. (9)

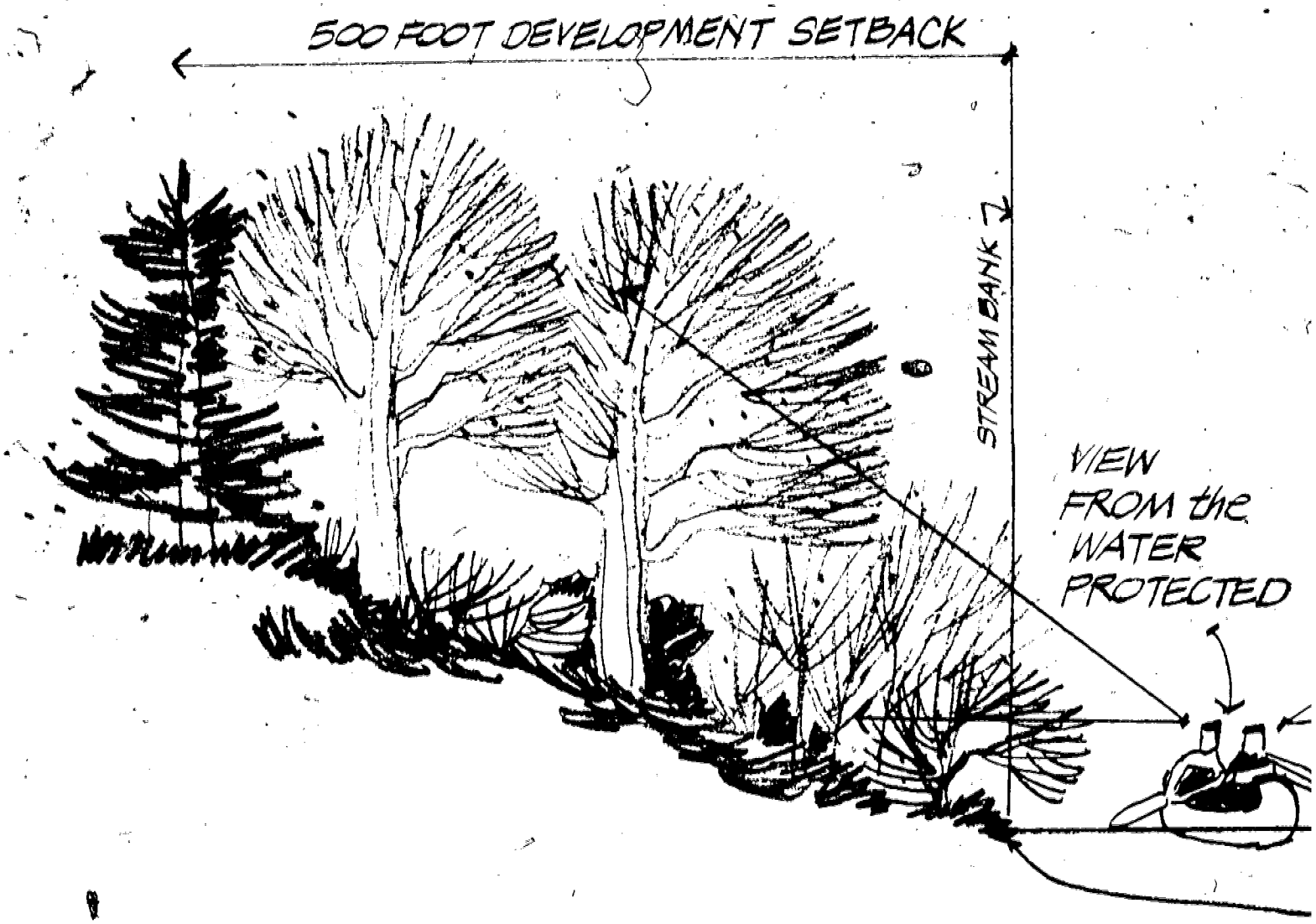
There are four general benefits derived from the development of water-oriented greenways:

1. *Protection of the natural environment*
   - water quality - aquatic ecology
   - wildlife - terrestrial ecology
2. *Public awareness*
   - focused concern about water quality
   - heightened interest in improving overall environmental quality
3. *The protection of health and safety*
   - protection from flooding and storm damage
   - mental health benefits
4. *Improved Cultural Environment*
   - aesthetic
   - heritage

The following is a expanded discussion of each benefit area.

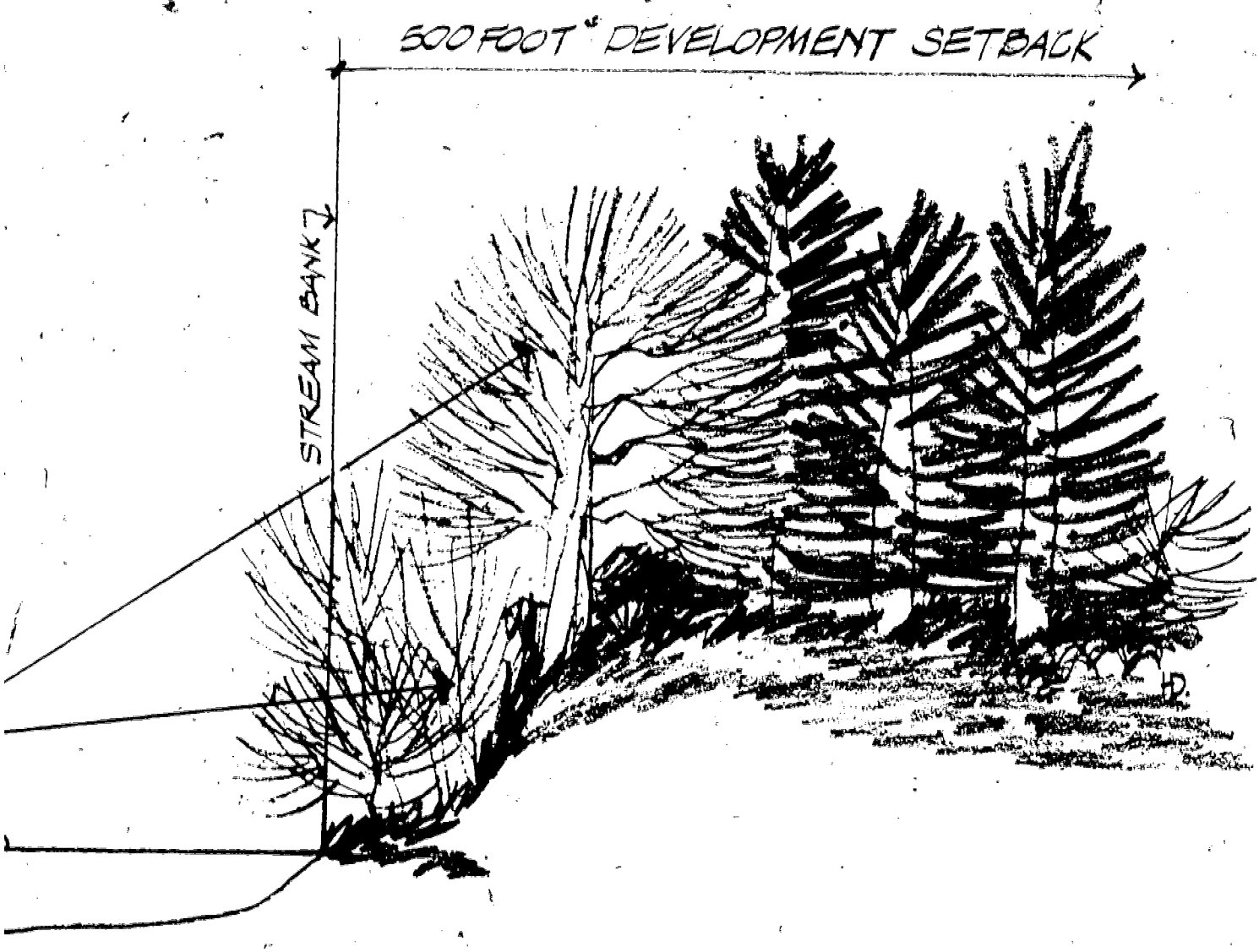


(9) Protecting the Environment Can Have $ Benefits


500 FOOT DEVELOPMENT SETBACK
STREAM BANK
VIEW FROM the WATER PROTECTED

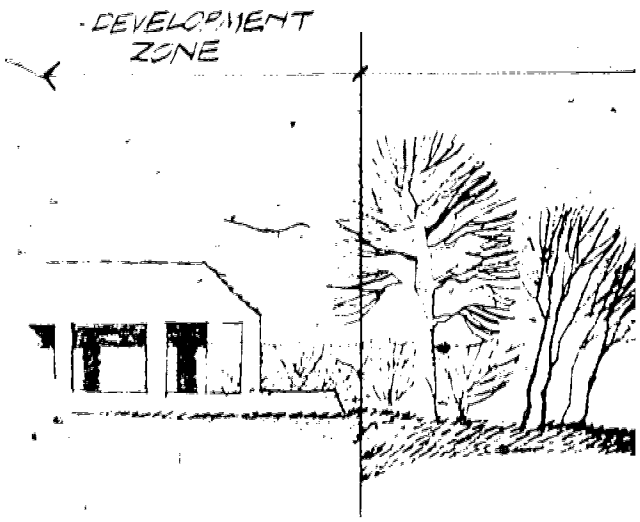
Protection of the natural environment

The strongest reason for initiating water-oriented greenways is the protection of the water resources themselves. Greenways can provide vegetative buffers that filter out non-point source pollutants such as erosion/sedimentation, chemical fertilizers, and urban litter. (10)

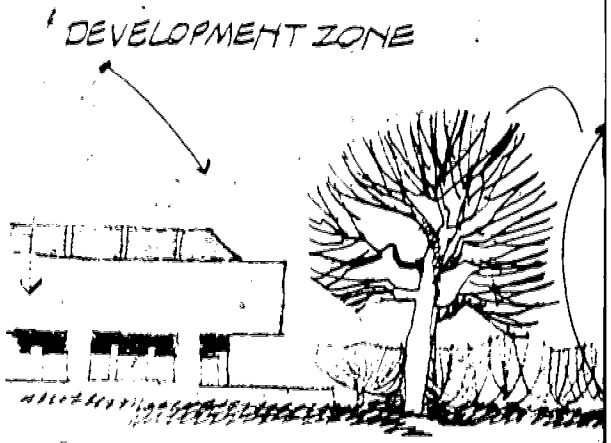


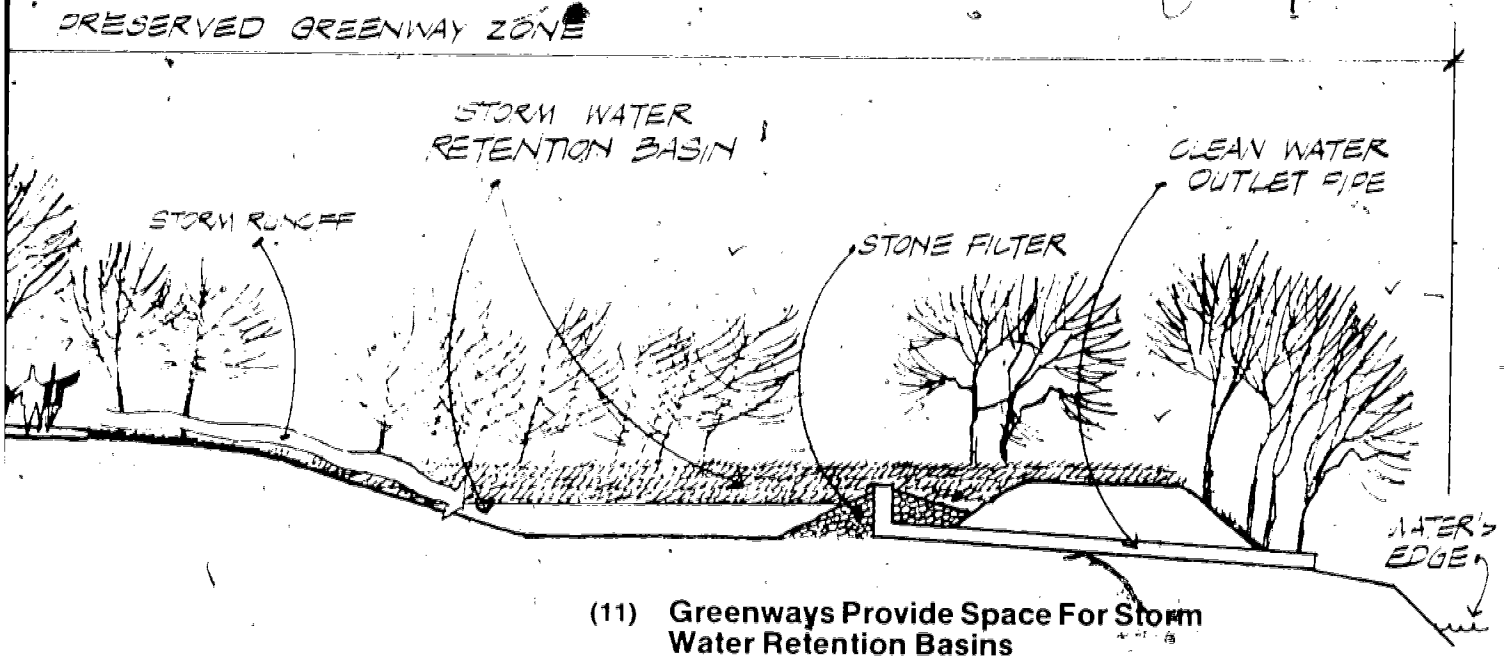
The 'Natural' Water-Oriented Greenway Requires a Protection and Preservation Emphasis

This potential for the control of nonpoint source water pollution provides a strong tool for achieving the goals of the 208 water cleanup program which is directly concerned and charged with the responsibility to control nonpoint source as well as point source water pollution. Greenways can provide this filtering function in agricultural areas as well as urban settings. Part of the filtering function is often accomplished through the use of storm water retention basins. These basins permit the settling of soil sediment (as high as 200 tons per acre per year in unprotected development areas) and the removal of nutrients and chemicals through underground filtration. Greenways can provide excellent locations for these water pollution control structures. (11)



Greenways can also provide protection for valuable wetland areas which are often exposed to dredging and filling activities causing loss of filtration capabilities, aquatic spawning grounds, and wildlife habitat. (12) In many urban areas rivers and shorelines provide the last migratory corridors for wildlife. Water-oriented greenways can ensure that those corridors remain open and safe. Often, industries such as fishing and recreation are dependent on clean water for survival. Protecting water-oriented environments is important to our economy.





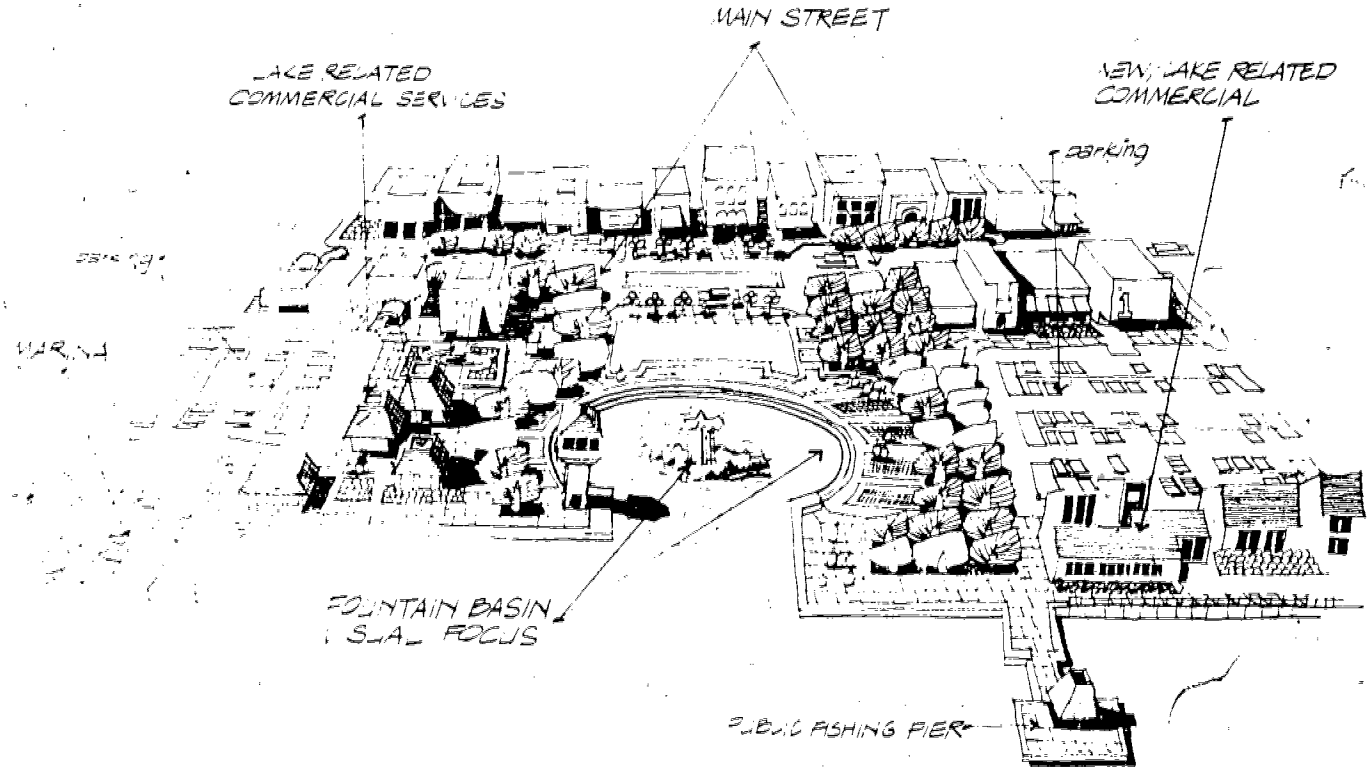
(11) Greenways Provide Space For Storm Water Retention Basins

(12) Greenways Can Protect and Preserve Valuable Wetlands

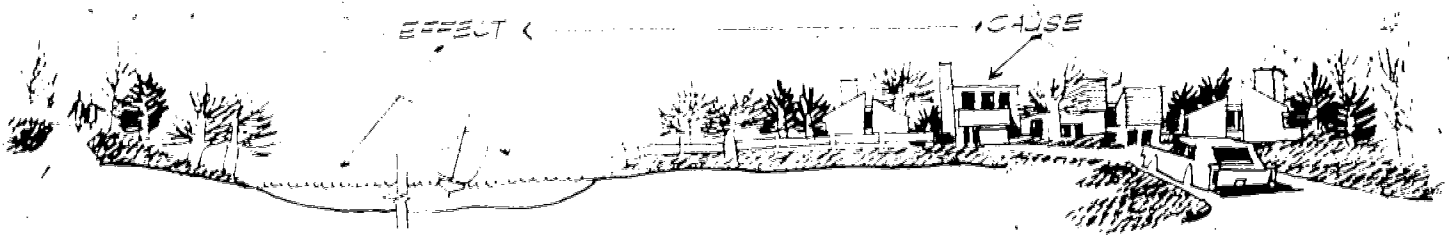
Public awareness

As discussed earlier, land use patterns evolve over a period of time in relatively small increments so as to be almost imperceptible. There are exceptions, however, in cases of natural disasters and sporadic development booms. But for the most part, the land use character of an area tends to evolve in a one-piece-at-a-time manner during normal growth periods.

This is one of the reasons that it took over one hundred years to become concerned about water quality. We turned our awareness of water quality off slowly. Greenways, on the other hand, can focus people's attention on the water by allowing them to get close to it, see it, touch it, smell it, and evaluate it.(13) In a sense the greenway permits the public to 'police' water quality. Greenways and related recreation facilities can bring water quality to people's attention. When people become concerned about water quality, they begin to realize that water quality is directly related to use activities on the land. Hence, an overall heightened awareness of environmental quality and stewardship for the *land* and *water* can be realized.(14)



(13) **Inland Lake Water Oriented Service Center**



(14) **Water Quality**

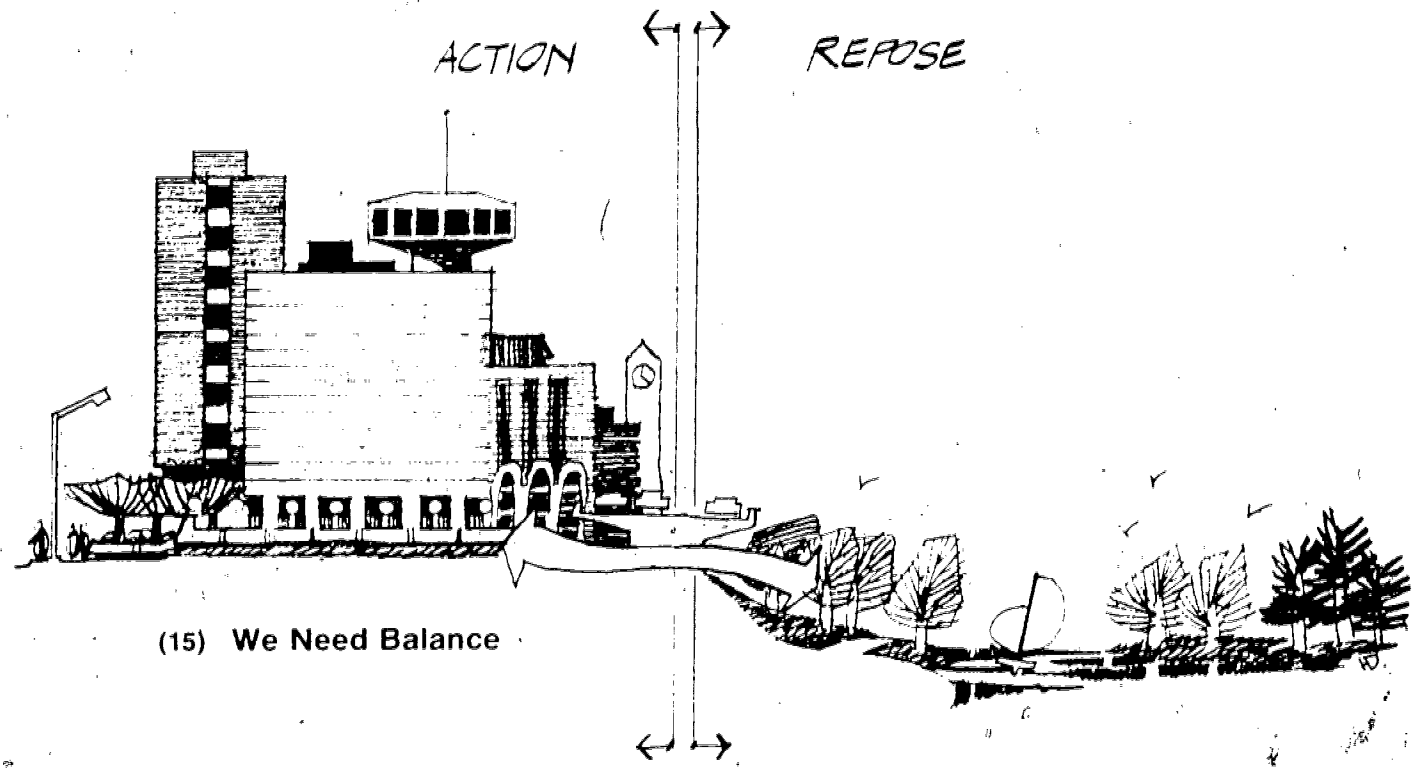
The protection of health and safety

Greenways can provide floodplain buffers as a non-structural control to absorb the impact of flood waters and reduce the danger and resultant property damage. Despite the billions of dollars spent on flood control structures, including dams, levees, and stream channelizations, flood damage payments continue to mount. The estimated annual flood damage as of 1975 has climbed to just under $2.3 billion.[1] Health hazards from sanitary sewers backing up, stagnant water, and the inability of emergency vehicles to reach the needy are all part of the storm and flood related disasters. Documentation of the need for floodplain use restructions is readily available from both State and Federal agencies.

Mental health problems are also related, at least in part, to environmental conditions. Although documentation is difficult, due to the many interpersonal variables involved, the quality of our physical environment is important to our mental health. We need a healthier balance between densely urban, highly active areas and more natural and quiet settings.(15)

Greenways can help provide this balance by offering close at hand, open space and recreational opportunities.

[1] The estimate was obtained from the Draft 1975 National Assessment to be published by the National Water Resources Council



(15) We Need Balance

Improved cultural environment

Environmental psychologists tell us that people need three visual qualities in any given setting:[2]

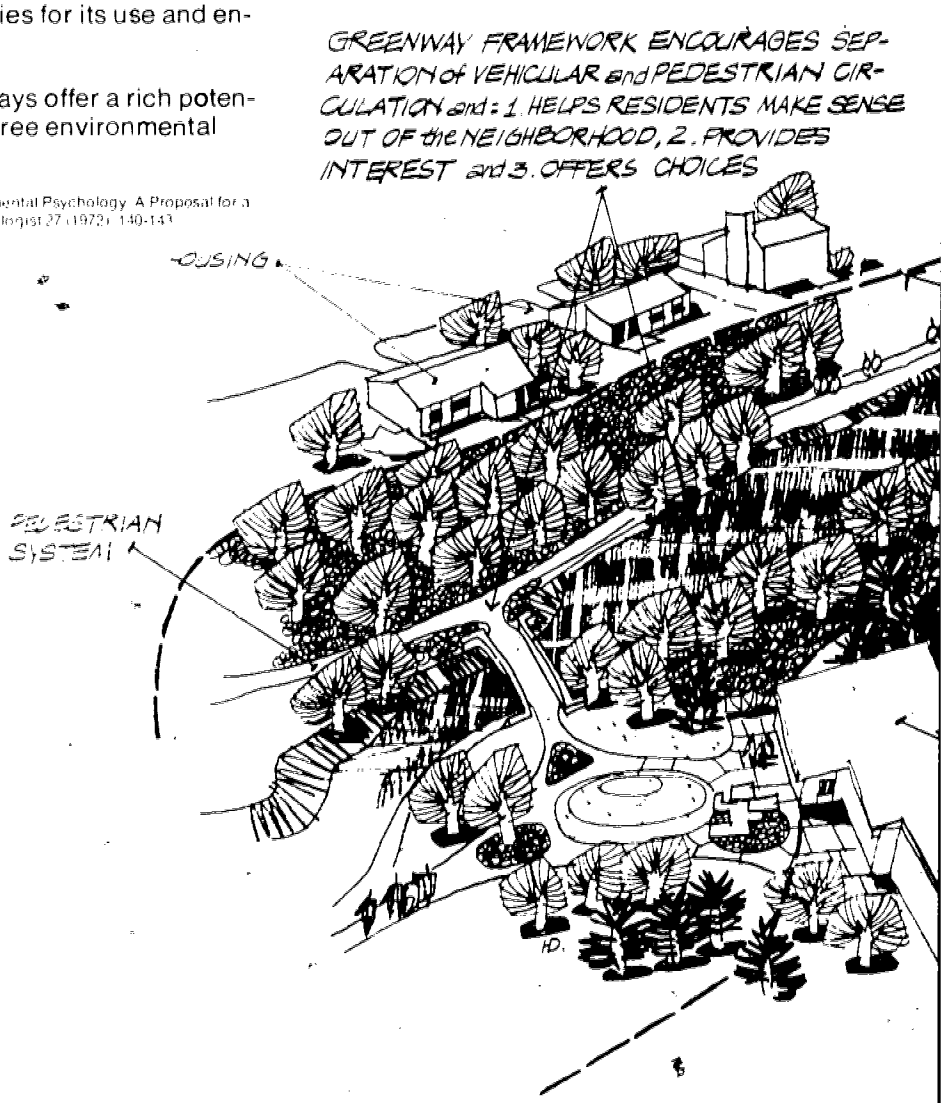
1. *The setting must make sense:* Questions like "where am I?" and "where are other people?" are answered through this quality.

2. *Offer potential for exploration:* The environment must provide interest which arouses our curiosity enough to make us want to learn more about it.

3. *Offer choices:* The environment should offer different possibilities for its use and enjoyment.

Water-oriented greenways offer a rich potential for meeting these three environmental criteria.(16)

[2] S. Kaplin, "The Challenge of Environmental Psychology: A Proposal for a New Functionalism," American Psychologist 27 (1972): 140-143.



(16) Greenways Can Improve The Cultural Environment

The Implementation Process

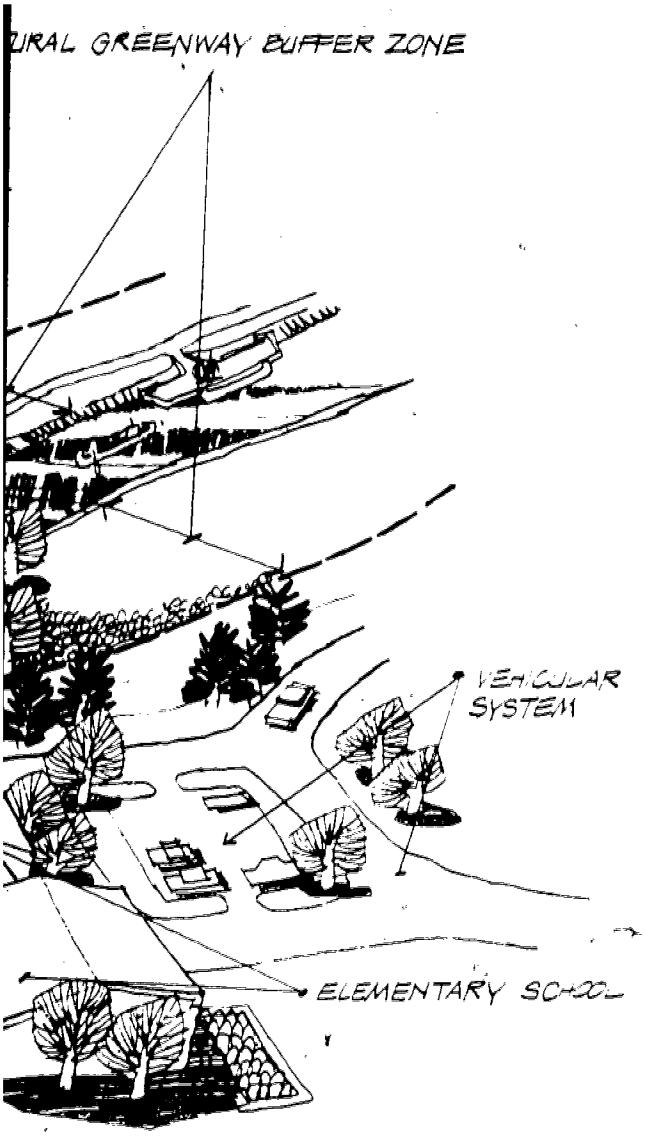
The process of planning and establishing water-oriented greenways can be simplified to three key questions:

1. *What do we have?* What kind of waterfront or shorelines are we dealing with? Where are its environmentally fragile areas and what are the current land use trends?

2. *What does it mean to us?* What are the development constraints and opportunities inherent in the environment being considered?

3. *What can we do about it?* What are the action possibilities available to provide for increased health and safety, improved environmental quality, and the protection of water resources?

These three questions form the basis for many communities' environmental decision-making processes. But before defining this process, we must understand who the initiators of water-oriented greenway efforts are.



The initiator role

The initiation of a campaign or movement for developing greenways can have a variety of origins ranging from local citizens' groups to a river being designated for preservation by an Act of Congress under the National Wild and Scenic Rivers Act. In cases where 208 agencies have been designated and regional water resource planning and management studies are being implemented, these agencies can aid greenway initiators by providing technical and coordinative assistance. The list below defines the various possible initiators of greenway planning and development.

- individuals, concerned citizen's groups, or non-profit nature conservancy groups
- city planning and parks departments or commissions
- township planning and parks boards or commissions
- watershed councils or commissions
- county planning and parks departments or commissions
- river or port authorities
- designated 208 water quality planning and management agencies
- State government planning agencies and commissions

- Federal agencies - EPA and BOR

Each of the above can initiate the implementation of water-oriented greenways either individually or in tandem with others on the list. It should be realized that greenway development is a cooperative effort and that information and technical assistance are available through the various agencies listed.

The community decision-making process

The three questions (What do we have?, What does it mean to us?, and What can we do about it?) can be rephrased and described as the community decision-making process. This is best thought of as a series of work phases or tasks. The process is generalized to provide an overview. In some cases, because communities may already be "in progress" especially with the early tasks, the process shown may not apply sequentially. Since water bodies and rivers often traverse many governmental jurisdictions, progress will tend to be uneven from one township or city to the next (this is one reason the 208 program came into existence).

Task 1: Assessment

This phase involves the collection and inventory of all the information available on the river or water body in question. The information can be logically classified into the following categories.

Natural Systems
- soils
- topography - drainage
- hydrology
- vegetative cover
- wildlife and fish habitat

Existing Land Use, Land Ownership, Transportation, and Utilities Networks.

Socio-economic and Demographic Trends (growth or decline rate)

Zoning and Proposed Plans

In many communities this information may be packaged in an existing community long range development plan or guide. This comprehensive community plan can be a valuable tool which already documents the need for greenways and in some cases often includes a plan for implementing them. If a long range plan doesn't exist, the complete process should be closely adhered to. It is obviously important to get the most up-to-date and accurate information available.

Task 2: Evaluation and analysis

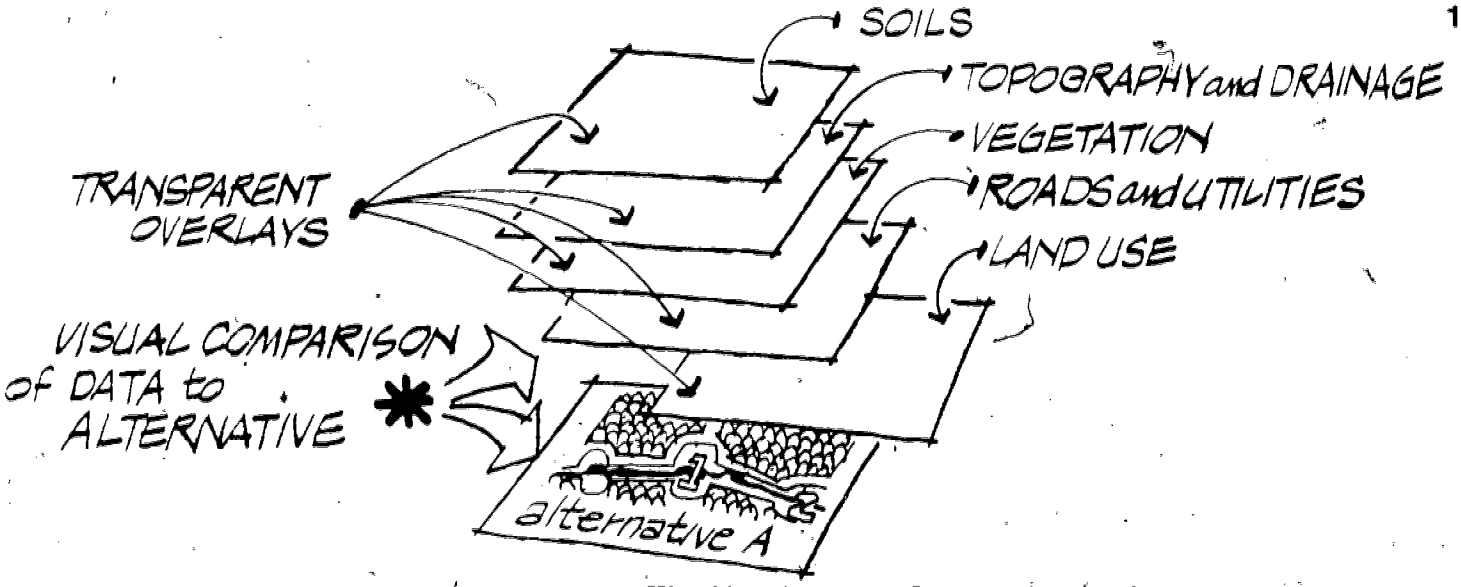
The evaluation step involves the application of values or criteria to the information collected under Task 1. To accomplish this in a logical way, it is helpful to have some specific objectives for clarifying the meaning of the assessment information. These objectives can best be stated as questions.

1. Where are the critical environments that are ecologically fragile? Are they facing strong development pressures? An example might be a wetland adjacent to an expanding housing subdivision area.
2. Where are and what are the unique ecological, scenic, and/or historical areas along the river or shoreline corridor? How valuable are these amenities?
3. Where are the job centers and economy sustaining industrial facilities located and what is their growth or decline potential? How do they affect water quality or greenway potential in terms of opportunities or constraints.
4. How do future community growth and development plans affect greenway potential.
5. How do the existing natural systems and land uses aggregate themselves in broad categories such as urban, suburban, and natural areas or zones.

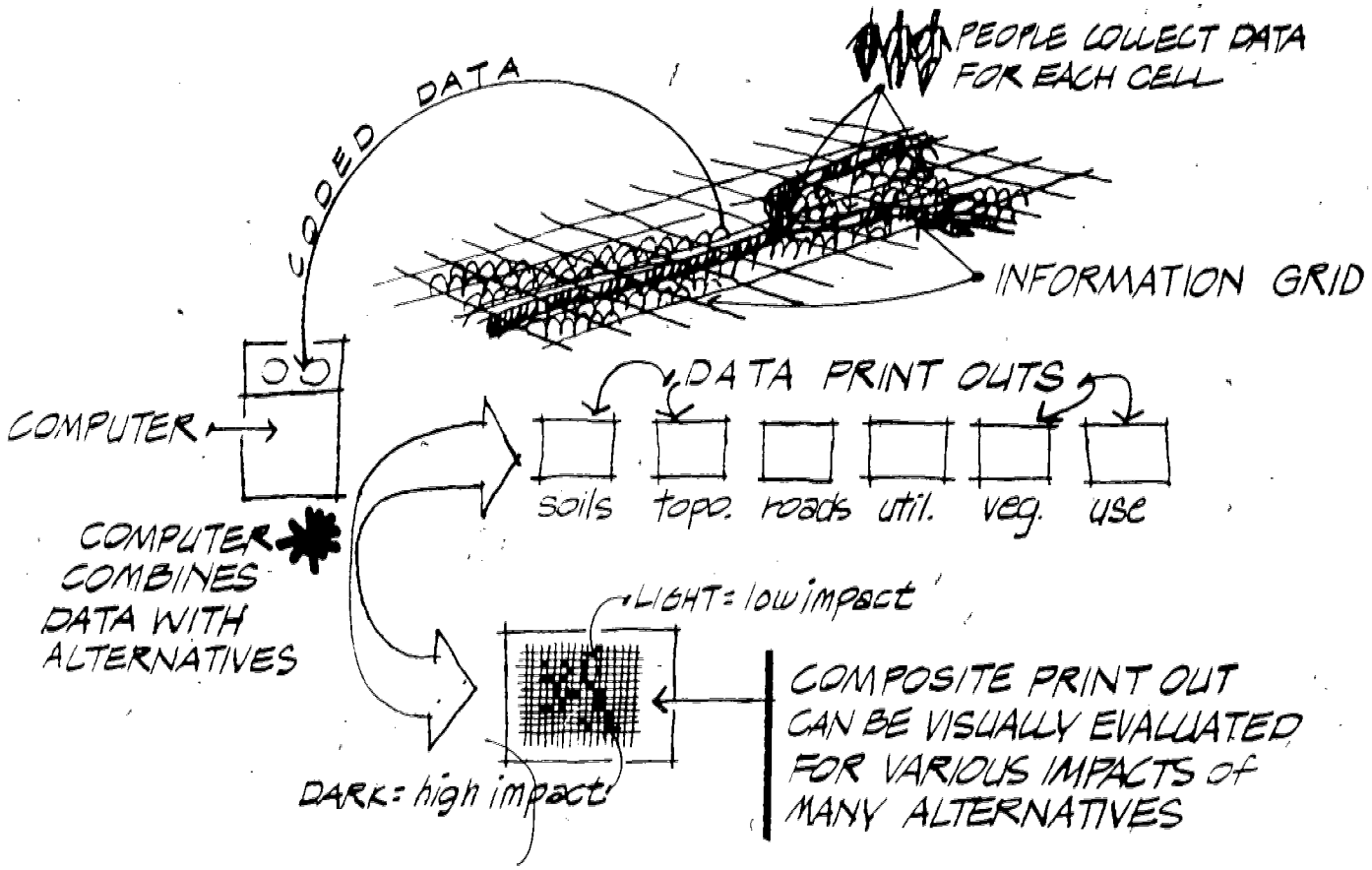
There are two techniques or tools used for performing this task, the hand drawn overlay technique and the computer data file process.

The hand drawn overlay system consists of a series of transparent overlay sheets that enable the comparison of natural systems with growth projections to determine environmental impacts, both positive and negative. In this way we can begin to apply criteria questions listed above. (17)

The computer data file system uses a grid of information cells which are numerically coded and stored in a computer. The computer is programmed to produce combinations of data and criteria to determine the impact of various development strategies. (18)



(17) The Hand Drawn Overlay Method



(18) The Computer Data File Method

There are advantages and disadvantages to both techniques. Either method can aid in determining answers to the evaluation questions considered. Keep in mind that the purpose of the evaluation and analysis task is to clarify specific greenway needs and to identify opportunities and constraints.

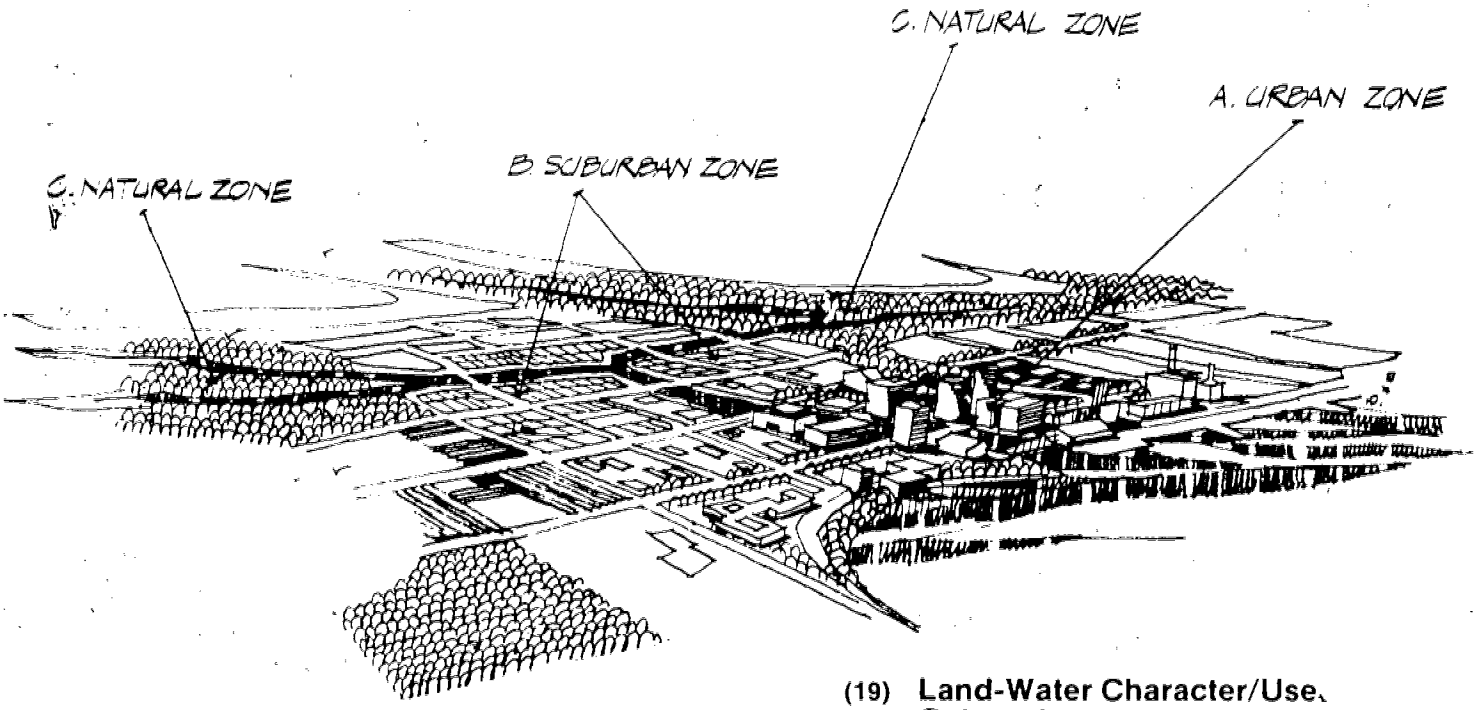
Task 3: The development of alternative greenway concepts

The advantage of developing alternative solutions to a problem is that it makes sure we consider a wide range of opportunities rather than narrowing down too quickly. Alternative solutions can help us to see broad overviews of the problem which, eventually, can lead us to a better solution. From past experience, we can generalize that there are three land-water characters or categories that must be dealt with in the development of alternative greenway concepts.*(19)

Urban Zones: these river or waterfront areas are characterized by hard surface paving, complex storm drainage systems, and land uses related to commerce and industry.(20)

Suburban Zone: these areas are characterized by a combination of soft ground cover and hard surface paving, storm drainage, and natural drainage; and a wide range of land uses including residential, commercial, recreational, and industrial uses.(21)

*The practice of aggregating or classifying land use or land character zones into broad categories is a commonly accepted method. The author recognizes, however, that there are often more than three categories involved depending on local conditions.



(19) Land-Water Character/Use Categories

Natural Zone: cultivated land and natural vegetation with little hard surface paving typify this zone. Farming and recreation are the prevalent uses with the exception of resource-oriented industries such as mining or logging. (22)

Each of these categories or zones presents a different set of needs for planning and management strategies and these needs vary tremendously. Therefore, any alternative greenway concept must respond differently to these zones. Concepts that fail to respond appropriately will be extremely difficult to implement.

The accompanying graphic illustrates an example of a greenway strategy that considers the three water-land zones and makes appropriate responses to each situation.

Another important benefit of developing alternatives is that they provide an excellent framework for triggering public involvement. Proposals tend to stimulate more communication and citizen input than the presentation of inventory and analysis documents.

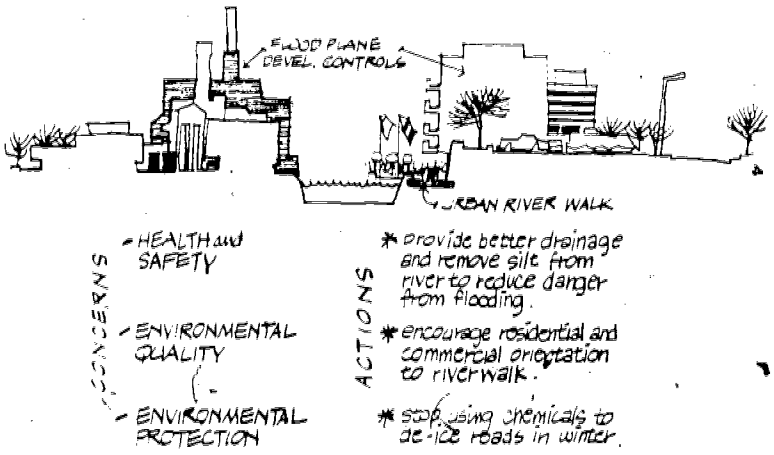
Task 4: Public involvement

Section 101(e) of the Federal Water Pollution Control Act Amendments requires that public participation shall be provided for, encouraged, and assisted by EPA and the States. EPA has published guidelines for achieving effective public participation.[5] Although these guidelines are intended for 208 water quality management agencies the following principles are easily adapted to serve greenway development.

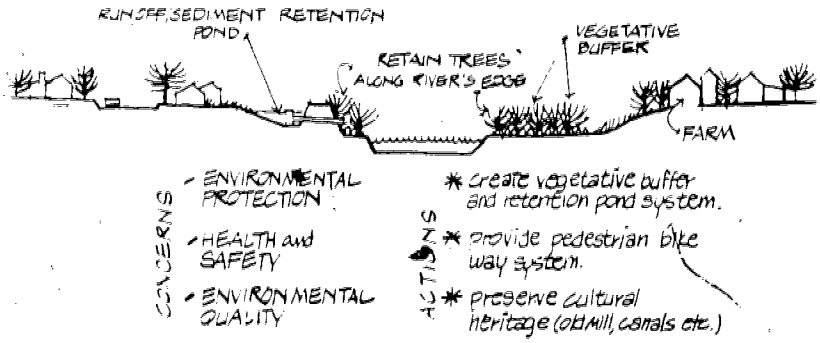
1. Agency Initiative: it is the task of the interest group or agency proposing the water-oriented greenway to generate and implement opportunities for public involvement. (Public meetings, special written notice, or media use are all possibilities.)

2. Target Key Groups: the initiator must seek out important publics. The various agencies listed under the section on The Initiator Role on page 17 should be invited to participate.

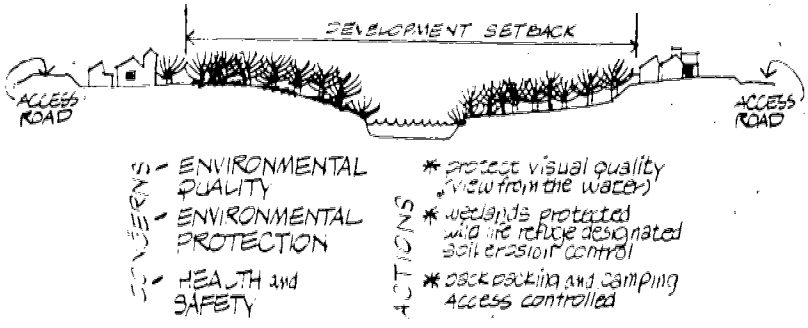
3. The Involvement Perspective: public participation must be an ongoing part of the



(20) **A. Urban Zone Strategy**



(21) **B. Suburban Zone Strategy**



(22) **C. Natural Zone Strategy**

[5] Public Participation Handbook for Water Quality Management. Environmental Protection Agency. June 1976.

greenway development process, not an add-on, after-the-fact program. Technical decisionmakers should be involved in the process.

4. Two Way Communication: information, ideas, and decisions must flow back and forth between the agency and the various publics.

Public involvement is rapidly becoming a complex combination of art and science. At best, we can only grasp a general overview of its basic principles and objectives. The ultimate objective is to obtain enlightened community goals from a concerned and mature public. For more information on the techniques of achieving responsible public involvement contact EPA's Regional Public Affairs Officer. (See page 31 for a list of EPA Regional Offices.) In considering who the key groups are, the greenway initiator should also contact Bureau of Outdoor Recreation (BOR) representatives at the regional level. (See page 31 for list of BOR regions) The BOR has a network of Regional Offices that aid in funding and implementing statewide comprehensive outdoor recreation plans. These plans provide for a logical and efficient Statewide plan for public recreation facilities. It is important to integrate the proposed greenway plan with the larger comprehensive recreation plan.

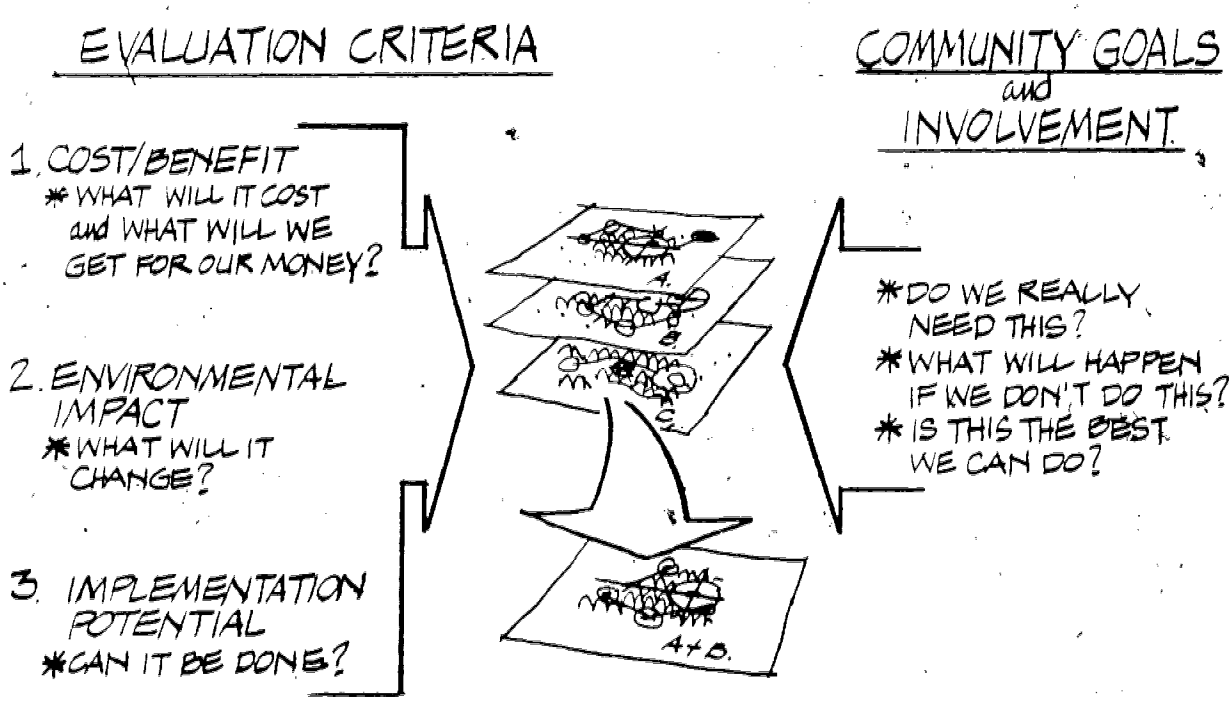
Task 5: Selecting the recommended alternative

One of the principal reasons for involving the public is to identify the important issues to be reckoned with. In general, these issues tend to lead to the following criteria for evaluating greenway alternatives.(23)

1. *Costs and Benefits:* long and short range benefits must be compared with projected capital improvement costs and projected management and maintenance costs.

2. *Environmental Impact:* positive and negative impacts must be considered for both natural systems and socio-economic systems.

3. *Implementation Potential:* the alternative selected must be fundable and as free of negative deterrents as possible. There should be substantial citizen support for the alternative.



(23) Selecting the Right Alternative

Local conditions can necessitate additional criteria when either unique natural conditions or an overriding economic land-use condition exists. In overview, the criteria used are applied to answer the general question of the greenway alternative's responsiveness to long range community goals.

Task 6: Implementation

The implementation of a water-oriented greenway involves the acquisition of land or land use rights; the design and construction of necessary capital improvements; and the operation, monitoring, and maintenance of the greenway. Through skillful phasing, all of these activities can occur simultaneously. A basic operating policy of the initiating agency should be to avoid exercising the right of eminent domain. This kind of litigation creates hard feelings and resistance which can sometimes overshadow the positive benefits of the greenway effort. Litigation also involves lengthy delays and the loss of momentum associated with them. The best policy is to try to work out an amicable agreement with the landowner involved.

There are four major ways of acquiring land and/or obtaining special use considerations in any given river or shoreline area:

1. *Purchase or Donation:* The simplest but not always the most practical technique involves the outright acquisition of the deed to the land. Donation may be outright or involve a life estate condition whereby the property is donated when the donor or his direct heirs die.

2. *Lease:* Land can be rented for fixed periods of time. This has short term benefits with long term liabilities unless the option to purchase at fair market value is included in the agreement.

3. *Easements:* An easement is an agreement to donate or sell specified rights such as the right to control visual quality or to provide public access for a specified time period or in perpetuity.

4. *Legislative Tools, Performance Controls:* Special zoning districts can be created and special development controls and permitting procedures can be added to a local zoning ordinance. The emphasis is on how development occurs instead of what development occurs.

Purchase agreements can involve lease or sell-back arrangements whereby the greenway agent attaches specific use restrictions to the deed which create and preserve the greenway. A major benefit of this approach is that maintenance of the land is not a burden to the local community because it remains the responsibility of the landowner. Performance controls are becoming more popular in recent years because they are not as restrictive as exclusionary types of land use controls. This kind of control becomes a part of the local community framework ordinance which emphasizes how to develop rather than what to develop. Examples of a performance control now in effect in many States are the soil erosion and sedimentation control laws. For further guidance in this area the reader should consult the recent EPA publication, "Performance Controls for Sensitive Lands: A Practical Guide for Local Administrators," published in March 1975, publication number EPA 600/5-75-005.

Another legislative aid to the implementation of water-oriented greenways is the Wild and Scenic Rivers Act. This legislation enables either the Federal or State Government to designate rivers which meet specific requirements specified in the act into one of the following classes:[6]

1. *Wild River Areas:* those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and water unpolluted. These represent vestiges of primitive America.

2. *Scenic River Areas:* those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

3. *Recreational River Areas:* Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Another legislative tool for protecting and preserving water-oriented open space is the

[6] "Guidelines for Evaluating Wild, Scenic and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic Rivers System Under Section 2, Public Law 90-542." Department of the Interior, U.S. Forest Service, 1970.

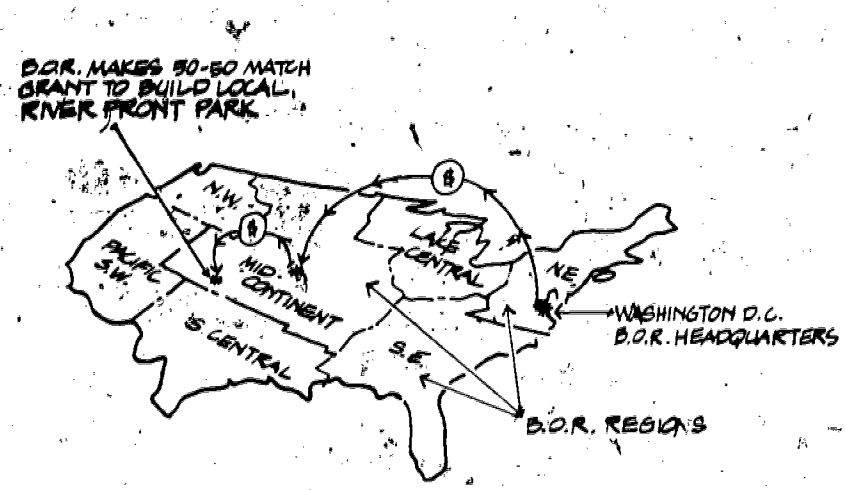
floodplain ordinance. Development on floodplain areas is restricted to non-structural kinds of uses, such as recreational activities. With this kind of restriction, the waterfront land becomes a zone which can tolerate flooding during peak flow periods. These ordinances are initiated and adopted by local government.

There are numerous techniques for protecting water-oriented open space. For further information on open space protection generally the reader may wish to consult a BOR publication entitled, *Protecting Nature's Estate - Techniques for Saving Land* (Stock number 024-016-00082-0). This publication may be obtained for $3.75 from the U.S. Government Printing Office, Washington, D.C. 20402.

Funding the acquisition and capital improvements necessary to develop a greenway system involves soliciting monies from both private and government sources. Private foundations often provide funds for park and recreation facilities as well as other urban open space projects. Non-profit, privately funded nature conservancies may also provide assistance for conservation and preservation efforts to protect natural areas. These foundations and conservancies are often locally based and therefore contact information must be obtained locally.

Government sources of greenway funding are generally located at the State government level through the State recreation department. These State agencies are funded in turn by the Department of the Interior's Bureau of Outdoor Recreation through the Land and Water Conservation Act. (24)

Funds are provided, at present, on a 50-50 local match basis and they can be used for planning the physical development of greenway corridors or shorelines. The donation of land and/or in kind services are both accepted as viable parts of the local government's matching funds. Local communities should contact their State Government's Department of Recreation for up-to-date information on available funding programs.



(24) The B.O.R.'s Land and Water Conservation Act Funding Effort: Provides Local Recreation Benefits

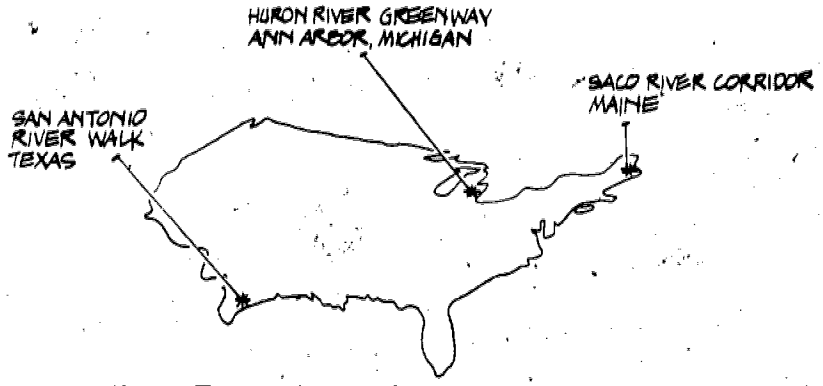
Examples

The following examples have been selected to illustrate specific principles that have been presented and discussed earlier about the techniques of planning and developing greenways. They have been chosen to represent a cross-section of urban, suburban and natural land-water characteristics. Each example focuses in on one important feature of the greenway system rather than illustrating the complete story of how the greenway came into being.(25)

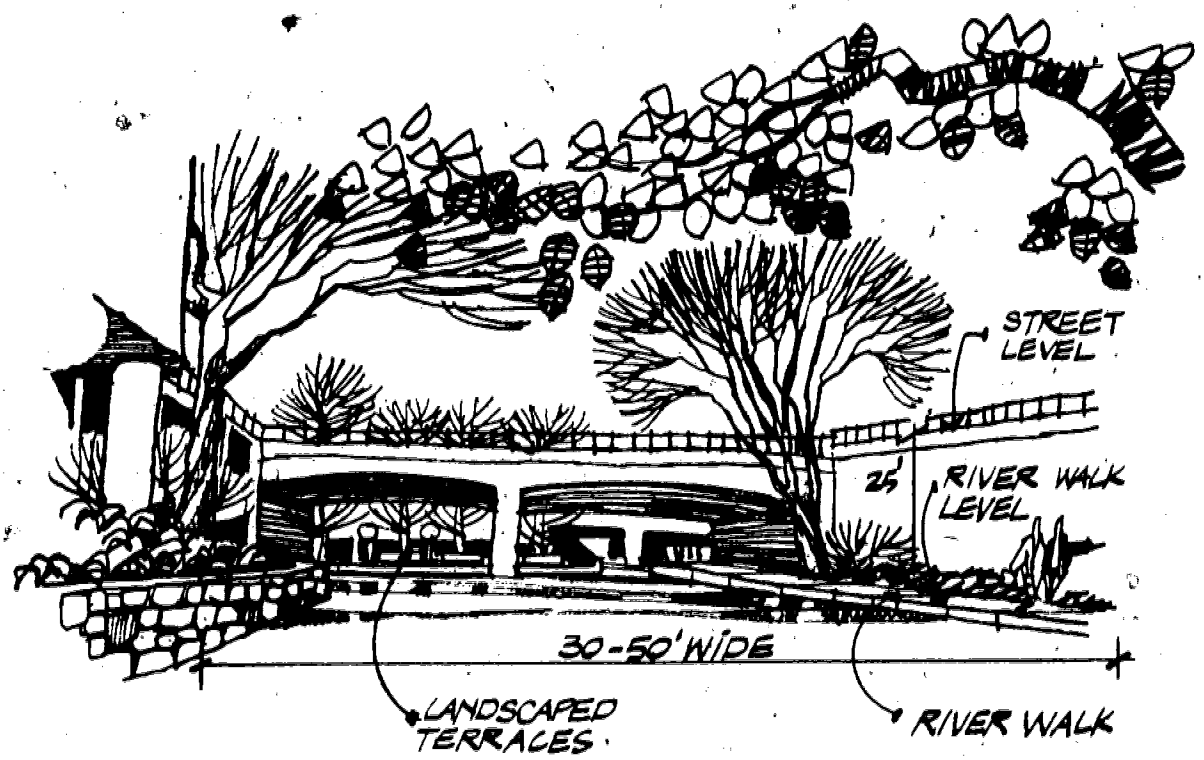
The Urban Greenway: San Antonio's River Walk

The San Antonio River Walk located in the heart of the downtown area occurs along the river bend and along a ribbon portion of the river for a one-mile stretch to the north of the bend. The river is 25 to 30 feet below the existing street level and there are approximately 44 sets of stairs connecting the river walk to street level. The river walk greenway system attracts over 2.3 million visitors a year.[1] (26)

[1]Dr. David Joel Reed, Social Interface at River's Edge, Guideline, National Recreation and Park Association, January 1973.



(25) **Three Examples of Greenway Benefits**



(26) **San Antonio River Walk: Physical Character**

PRIVATE and CIVIC

- LANDOWNERS and DEVELOPERS
- CONSERVATION SOCIETY
- CHAMBER of COMMERCE
- RIVER WALK COMMISSION
- RIVER WALK ASSOCIATION
- KIWANIS CLUB

PUBLIC/GOVERNMENT

- FEDERAL
  - WORKS PROGRESS ADMIN.
  - CORPS of ENGINEERS
  - HOUSING and URBAN DEVELOPMENT
- STATE
  - SAN ANTONIO RIVER AUTHORITY
  - WATER QUALITY BOARD
- COUNTY
  - BEXAR
  - ALAMO AREA COUNCIL OF GOVERNMENTS
- CITY of SAN ANTONIO
  - WATER BOARD
  - PARKS and RECREATION
  - PLANNING
  - LIBRARY
  - PUBLIC HEALTH

* ADAPTED FROM TABLE pp. 5-7, D.J. REED, SOCIAL INTERFACE AT RIVER'S EDGE, NATIONAL RECREATION and PARK ASSOCIATION, JANUARY/FEBRUARY 1973

(27) Participants in River Walk Development

While this development provides an excellent example of urban riverfront design, it is an especially good example of cooperative teamwork. The diagram shows a creative combination of private and civic groups working with all levels of government. It incorporates and responds to a wide range of community values from flood control to historic preservation and has been over 40 years in the process.[8] (27)

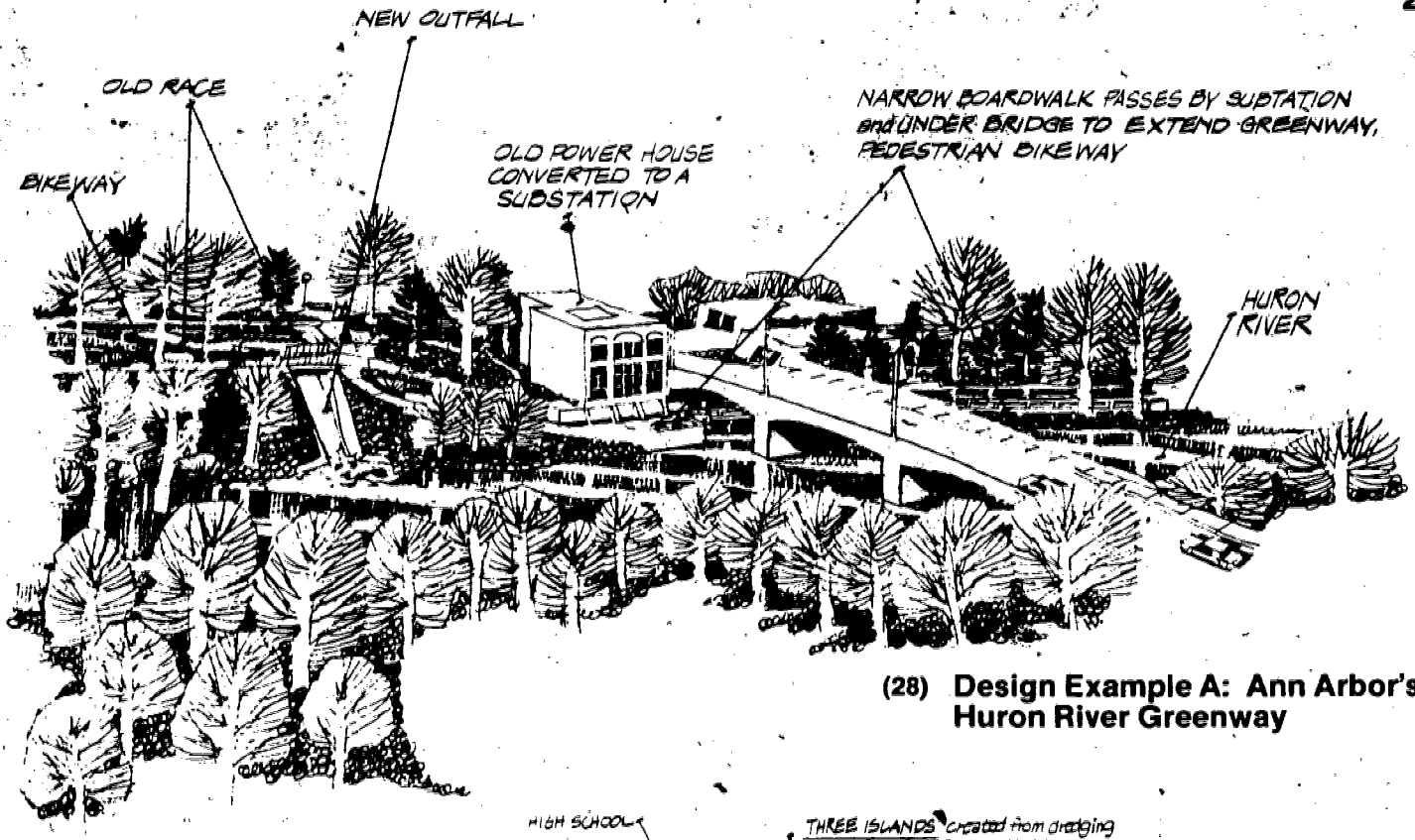
The Suburban Greenway: Ann Arbor's Huron River Greenway

In the late 1960's, the City of Ann Arbor became concerned about the future of the Huron River Valley which separated the University of Michigan's Central and North Campuses. Development pressures were growing to add new roadways and develop the area with a wide range of land uses. There were many physical constraints to developing a greenway along the river, but through quick action by the City of Ann Arbor's Recreation and Park Planning Department, voter approval was obtained for a $3.5 million bond issue for land acquisition and park development.

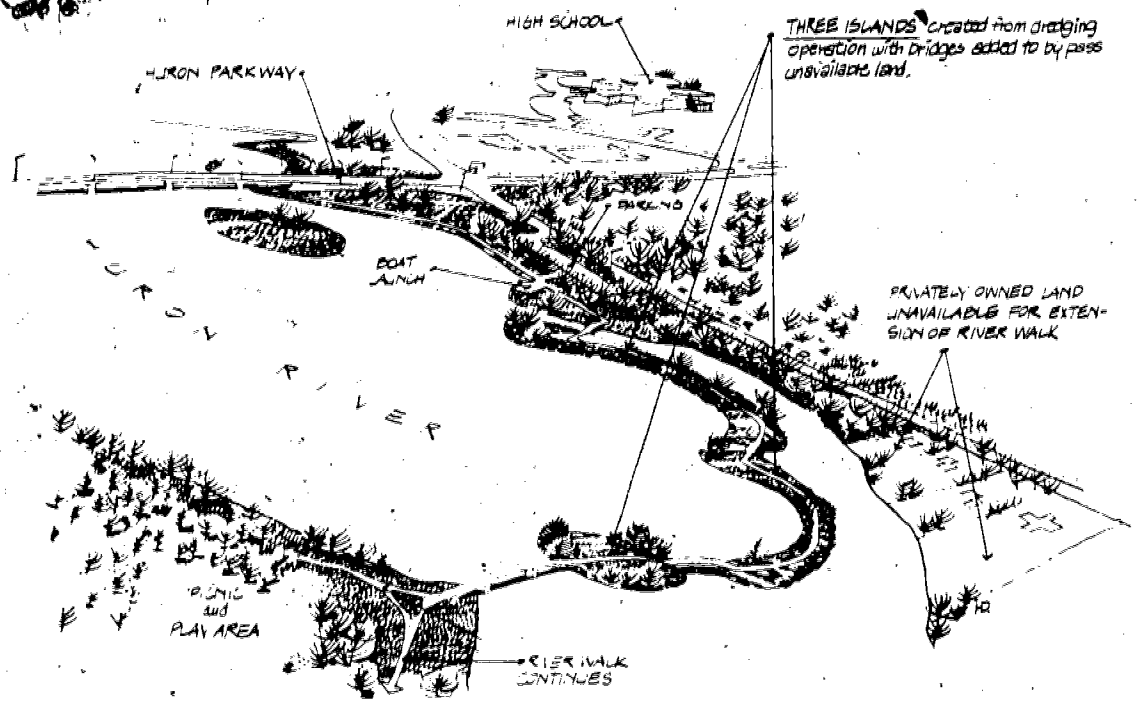
The Huron River Greenway features several examples of imaginative design solutions to land acquisition problems. Design Example A (28) involved the problem of continuing a pedestrian-bikeway along the river where no land was available and an electrical substation blocked the only apparent passage along the river. The design solution involved creating a 6-foot wide walkway with a parapet wall around the foundation of the substation. From the substation a boardwalk bridge was extended under an adjacent vehicular bridge on through to open space beyond.

Design Example B (29) involved utilizing material dredged from the river bottom to create a series of 'stepping stone' islands

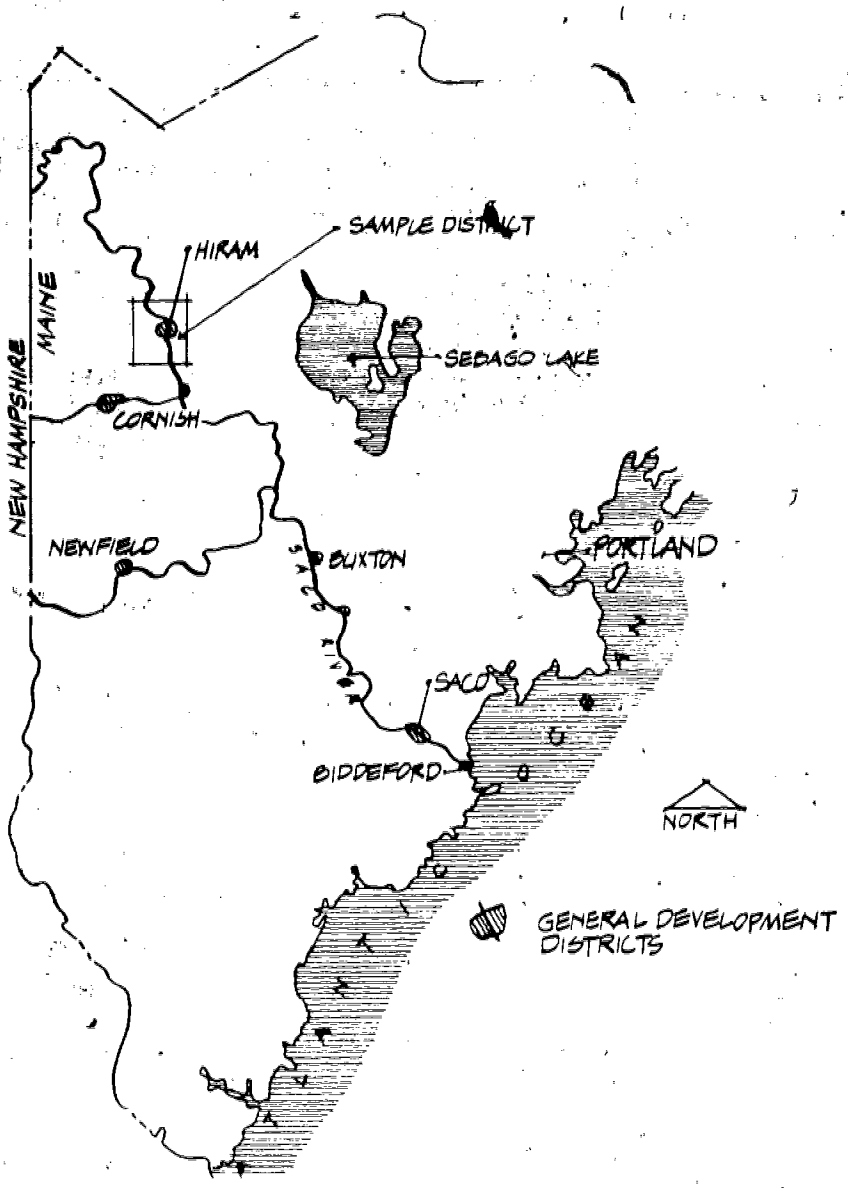
[8] Ibid



(28) **Design Example A: Ann Arbor's Huron River Greenway**



(29) **Design Example B: Ann Arbor's Huron River Greenway**



(30) Saco River Greenway System

across the river. The landowners along the river shoreline would not sell easement rights for the walkway along its planned right-of-way. Using the islands and four arching pedestrian bridges, their land was bypassed and the walk was continued along the opposite shoreline.

The Natural Greenway: Maine's Saco River Corridor

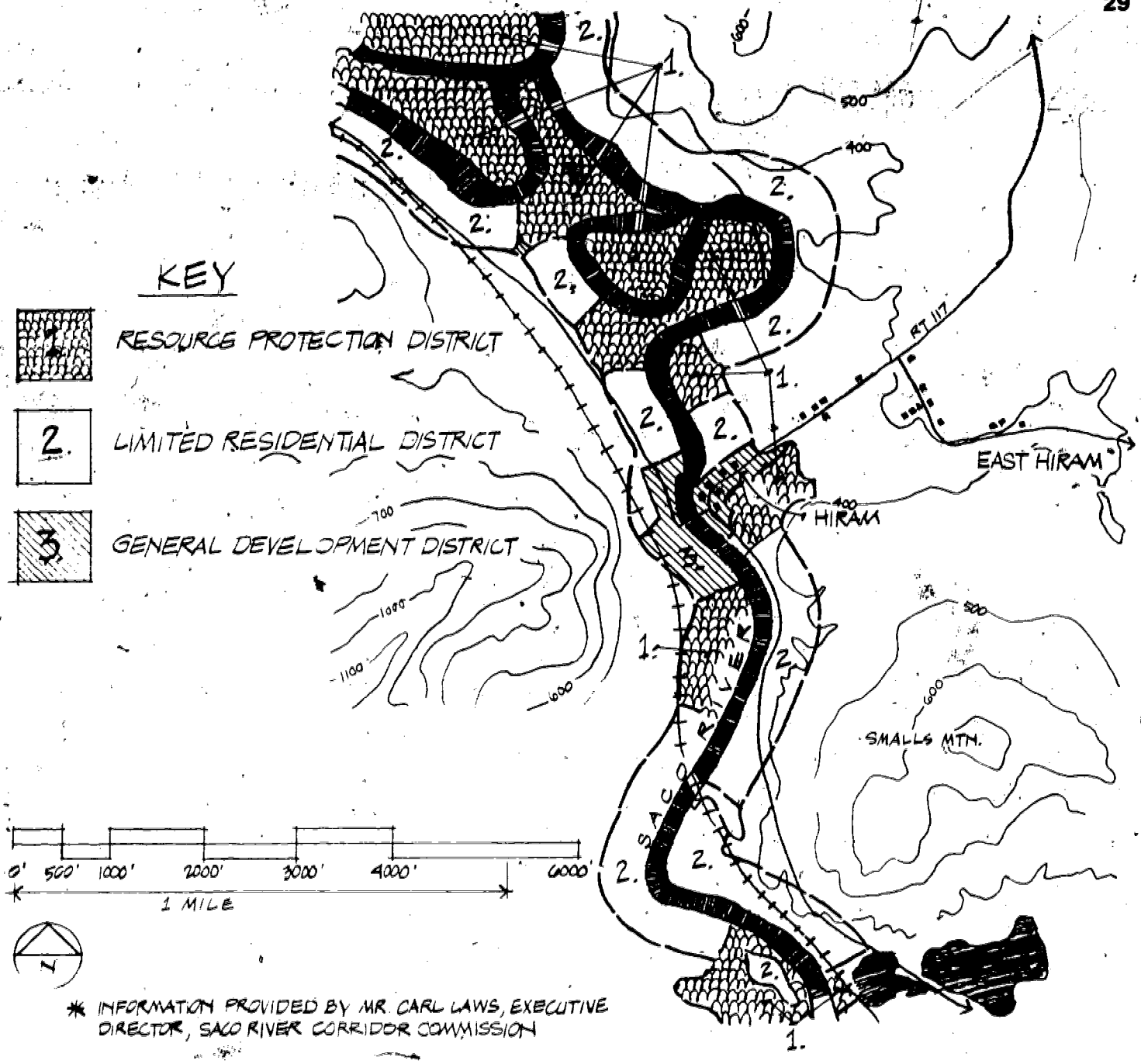
The Saco River Corridor Commission maintains land and water quality along a 150-mile-long river corridor running from the mouth of the river at Biddeford-Saco to the Ossipee and Little Ossipee Rivers to the Maine/New Hampshire border. The corridor includes 20 towns and 3 counties. Through the passage of "An Act to Establish the Saco River Corridor in 1973," the 106th State Legislature enabled the Commission to set up three distinct kinds of Resource Districts: (30-31)

1. *The Resource Protection District:* includes, areas where the entire width of the corridor is within the 100-year flood plain, wetlands, and lands designated by private or public landowners for inclusion in the district.

2. *The Limited Residential District:* predominant use is residential, but within a framework intended to promote diversity and low density.

3. *The General Development District:* includes areas that have already been intensively developed. Permits are required for manufacturing and industrial uses. Junkyards are prohibited.

The Saco River Corridor presents an excellent example of responsiveness to the existing land-water and land use characteristics. Performance controls of varying emphasis are used in the three different districts. The Saco River Commission serves as a fine example of effective, local, land-use control.



(31) **A Sample District Classification Saco River Corridor**

The need for coordination

The two Federal agencies playing dominant roles in the development of water-oriented greenways are EPA and The Bureau of Outdoor Recreation (BOR) within the Department of the Interior. Working as partners with greenway initiators at the local and State levels, there are unlimited opportunities to realize valuable public benefits.

As was mentioned earlier, there are often problems involved in the development of greenways when they are spread over several governmental jurisdictions. The designated 208 agency at the State or regional level can serve a valuable role as a coordinator of greenway projects involving the cooperation of many governments. The agency can provide a forum for public involvement and has trained planners and resource policy professionals who can aid in the technical work needed.

If a 208 agency does not exist in your area, a local watershed council can also serve the role of coordinating agency. Watershed councils have a clear sense of what the overview problems are within their areas and are an excellent source of information, coordination and technical assistance.

The Land and Water Conservation Act administered by the Bureau of Outdoor Recreation provides a prime source of matching funds to help implement the site planning and construction of specific recreation developments. BOR's funded Statewide Comprehensive Outdoor Recreation Plans provide excellent frameworks within which greenway can plan an important and effective role.

Conclusion

The development of water-oriented greenways is not a simple, one shot effort. It involves a long range goal backed with solid government and citizen support. Those three basic questions; What do we have., What does it mean to us. and What can we do about it. can be answered through the application of an effective community decision-making process.

The implementation of water-oriented greenways provides a creative challenge for all of us. The benefits include long-range payoffs such as improved health and safety, protection of water and land resources and the improvement of environmental quality. The timing for establishing greenways is important because land values will escalate as people become more and more aware of the secondary benefits of clean water.

There are many fine examples all around our country of greenway success stories. From Texas to Michigan to Maine, people are waking up to the opportunities along our shorelines and river corridors. It took 150 years to defile our water resources. The Federal Water Pollution Control Act Amendments of 1972 call for clean water by 1983. The time for planning and implementing water-oriented greenways is now.

The following is a list of EPA's Regional Offices.

EPA Region 1
Room 2303
JFK Federal Building
Boston, MA 02203

EPA Region 2
Room 1005
26 Federal Plaza
New York, NY 10007

EPA Region 3
Curtis Building
6th and Walnut Streets
Philadelphia, PA 19106

EPA Region 4
345 Courtland St., NE
Atlanta, GA 30308

EPA Region 5
230 South Dearborn Street
Chicago, IL 60604

EPA Region 6
1201 Elm St.
Dallas, TX 75270

EPA Region 7
1735 Baltimore Street
Kansas City, MO 64108

EPA Region 8
Suite 900
1860 Lincoln Street
Denver, CO 80203

EPA Region 9
100 California Street
San Francisco, CA 94111

EPA Region 10
1200 Sixth Avenue
Seattle, WA 98101

The following is a list of BOR's Regional Offices.

Northwest Region
Federal Building, Room 990
915 Second Avenue
Seattle, Washington 98174

Pacific Southwest Region
P. O. Box 36062
450 Golden Gate Avenue
San Francisco, California 94102

Mid-Continent Region
Denver Federal Center
P. O. Box 25387
Building 41
Denver, Colorado 80225

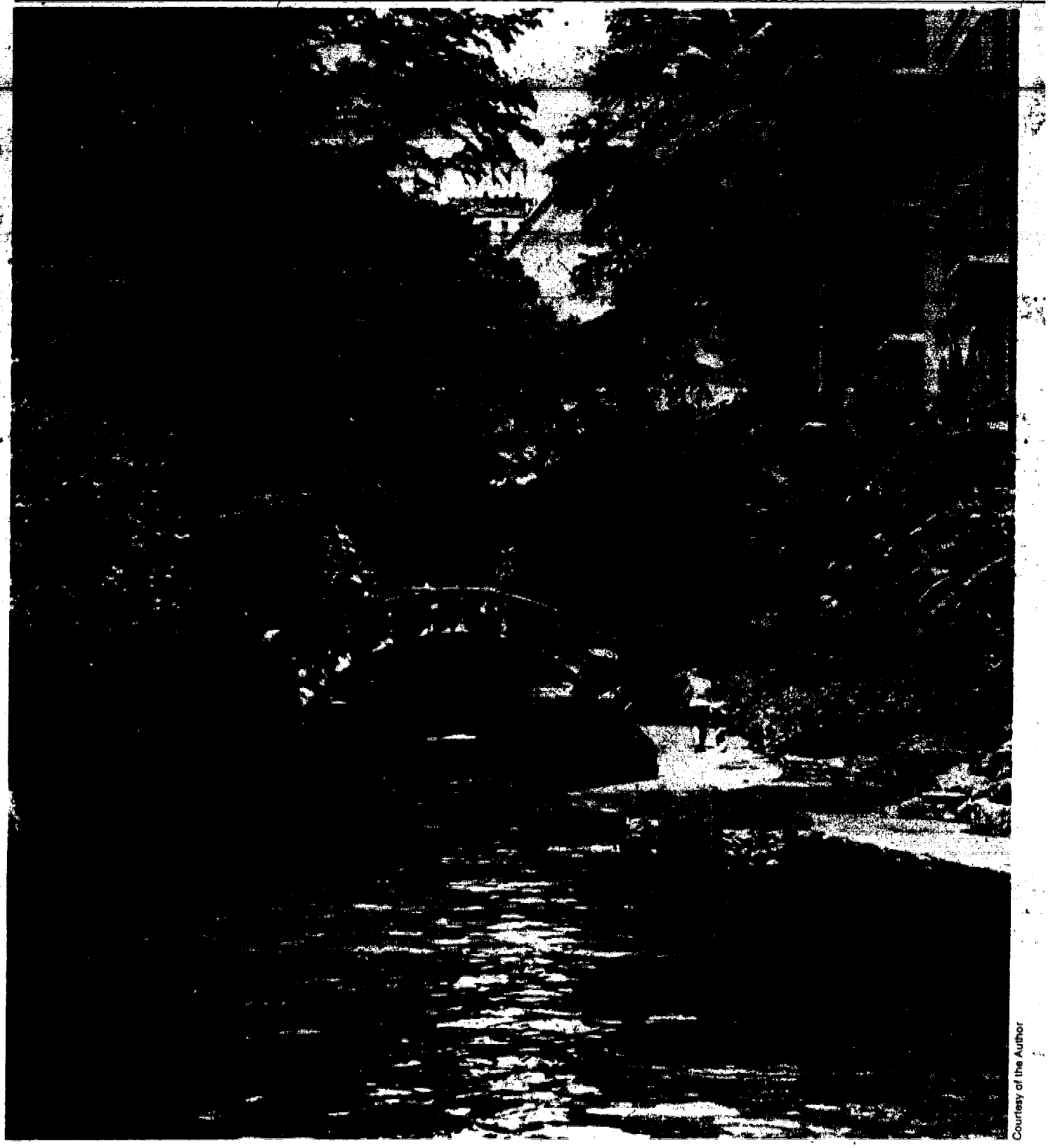
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Southeast Region
148 Cain Street
Atlanta, Georgia 30303

Northeast Region
Federal Office Building
600 Arch Street
Philadelphia, Pennsylvania 19106

South Central Region
Patio Plaza Building
5000 Marble Avenue, N. E.
Albuquerque, New Mexico 87110

San Antonio's River Walk



Courtesy of the Author